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February 4, 2020

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Executive Summary

We designed and evaluated icons (buttons or logos) and text taglines that effectively signal the presence of an opt-out choice related to the sale of personal information, required to be available to California consumers under the California Consumer Privacy Act. Additionally, our research also explored an icon and text tagline that signalled consumer privacy controls beyond a "do not sell" opt-out to accommodate additional controls related to the collection and processing of personal information. We tested 12 icon designs and 16 taglines in a series of online studies aimed at determining which best communicated accurately and were least likely to lead to misconceptions. We conducted a final evaluation with three icon designs and five taglines from our initial evaluations to determine which combinations of icon and tagline were

best at conveying the presence of choices related to the sale of personal information, as well as privacy choices more generally. In each stage of our evaluation we employed quantitative and qualitative analysis methods that are common in the field of human-computer interaction. We make the following recommendations based on our study results:

To convey the presence of a choice, a toggle icon should be used. Our participants favored a *toggle* icon as a representation of choices over how websites can use their personal information. Even when the icon was tested alone, without being paired with a text tagline, the most common interpretations of a *toggle* icon indicated the ability to accept/decline or activate/deactivate something. Furthermore, a *toggle* icon did not lead to any misconceptions that were particularly problematic. In contrast, an icon featuring a "$" with a red slash over it was harder for participants to interpret and sometimes led to the expectation of seeing payment options, that cash or dollars are not accepted, or that something is free or requires no money. This icon did not lead to an association to the sale of personal information, or even choices more generally.

The CCPA icon needs to be accompanied by a text description. Our testing shows that the addition of a tagline has a major impact on how people interpret an icon. Additionally, our results suggest that even when icons become more familiar, that familiarity does not necessarily translate to accurate interpretations. In the most successful cases in our testing, without a text description participants correctly recognized concepts related to choice, payment, and stopping, but did not connect these with personal information. Thus, a short descriptive text tagline is necessary in order for an opt-out or choice-related mechanism to be usable. Once an icon has been broadly adopted, future studies may re-evaluate whether the icon can be used without text description.

To convey the presence of a "do not sell" opt-out, CCPA taglines "Do Not Sell My Personal Information" and "Do Not Sell My Info" should be used. Our findings indicate that the CCPA taglines were most effective in conveying the expectation of choices related to the sale of personal information, regardless of the icon these taglines were paired with. It is important to consider that a shorter tagline may work better across different websites and environments, such as mobile apps and browsers. We found that "Don't Sell My Info" had similar performance as the two taglines currently in the regulations in creating an expectation of "do not sell" choices. However, further shortening the tagline to "Do Not Sell" and "Don't Sell" was problematic, as without a reference to "my info" these taglines did not lead participants to think about the sale of their personal information.

To convey the presence of privacy choices more generally, a toggle icon paired with the text tagline "Privacy Options" should be used. To accommodate potential future regulatory requirements related to the use of personal information and to signal that other privacy choices are available, an icon less specific to "do not sell" may be appropriate for the context of CCPA. Our analysis suggests that a *toggle* icon paired with "Privacy Options" performed best in terms of conveying the presence of a privacy choice. Replacing "Privacy Options" with "Privacy Choices" was a close second.

The existing Privacy Rights icon and AdChoices icon suggest a place for more information, but not privacy choices. We tested both the green Privacy Rights icon that the Digital Advertising Alliance recommends for CCPA compliance and the blue AdChoices icon that has been used to signal behavioral advertising privacy choices since 2011. Neither were widely recognized by our participants. The lowercase "i" in these icons conveyed the concept of "more information" and the triangle shape conveyed the concept of an audio or video "play" button, but the icon failed to communicate the ability to make choices or opt-out.

Placement of the opt-out should be standardized by regulation. While we did not specifically study placement of the opt-out, regulation, such as the CCPA, can play a major role in helping consumers find privacy choices by standardizing where the choice must be placed on a website, considering both desktop and mobile browsers. Standardizing placement of the opt-out allows users to form a consistent expectation about where to find them that carries across different types of companies and services with which they interact.

Regulations should be supplemented with public education. While our study did not look at whether people would notice the icon during the course of their normal activities, it is likely that many people will not notice it even if commonly implemented on websites. Furthermore, our testing found evidence that widespread implementation of an icon is not enough. Though an intuitive icon and tagline combination, as highlighted in our recommendations, would have a great impact on communicating the presence of a "do not sell" or other privacy choices, an information campaign will be critical to educate the public once the icon and text tagline are finalized in regulation.

The best icon to pair with current CCPA taglines to convey a "do not sell" opt-out is a *toggle* icon. This combination effectively communicates the presence of a choice, particularly one related to the sale of personal information.

 Do Not Sell My Personal Information

The best choice overall to convey the broader concept of privacy controls is the "Privacy Options" tagline accompanied by the *toggle* icon. This combination effectively conveys privacy choices and settings. It could become a standardized means for accessing privacy-related choices, including CCPA opt-out of the sale of personal information, supporting consumers' ability to locate these choices in a consistent location without the need for a proliferation of privacy-related links and icons.

 Privacy Options

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1. Introduction

Privacy advocates and legal experts have argued for the need to standardize icons and mechanisms for communicating data practices to consumers and allowing them to exercise choices. One implementation of this is section 999.306 of the California Consumer Privacy Act (CCPA) which mandates that companies provide a notice to California residents about their right to opt-out of the sale of personal information available through a required web link and, optionally, a standardized opt-out button or logo. In order to ensure that such an opt-out mechanism is understood by and effective at helping consumers exercise their opt-out right, the required design must be evaluated through user testing. Building on our expertise and research on usable opt-out mechanisms, we tested a wide range of design options for providing such an opt-out for the sale of personal information.

The objective of this research was to develop a validated set of practices for companies to follow when offering CCPA-mandated opt-outs for the sale of personal information, resulting in recommendations for the opt-out button or logo (which we refer to as the "icon") and accompanying web link text (which we refer to as the "tagline"). In developing our recommendations, we attempted to find a design that optimizes the ability for users to understand the icon as an opt-out mechanism for the sale of personal information specifically or as a privacy control more generally. The Office of the California Attorney General can leverage our results in their continued development of regulations for the CCPA. Additionally, we were interested in conveying the broader concept of privacy control rather than merely presenting the narrow 'opt-out of sale' concept, so that companies can use the same button to take users to multiple privacy-related controls or a privacy dashboard instead of having to provide separate opt-out links for a range of data practices. Consolidating privacy controls in one place simplifies the user experience and makes it easier for users to exercise privacy choices. By adding privacy control as one of our foci, our recommendations are applicable to websites that already offer other types of privacy controls, as well as regulators who want to develop future requirements for other privacy controls.

Our design and testing approach incorporated several common methods deployed in usability-oriented interface design. After undergoing a requirements gathering process, we consulted established design guides for web interactions and we leveraged prior work in this space to develop design ideas for the icon. We also held design workshops and brainstorming sessions within our larger research groups at Carnegie Mellon and the University of Michigan. We conducted multiple rounds of online user testing to capture user reactions, make refinements, and identify final candidates for both the icon design (Section 2) and tagline (Section 3).

We validated our final candidate icon designs and taglines in a large-scale online user study, with 23 conditions (Section 4). The design candidates were placed in the context of a fictitious shopping website (an online shoe store). Across the study conditions we changed only the icon

and tagline. Following a between-subjects design, study participants were presented with only one of those variants and asked to complete a short follow-up survey to test their comprehension of the opt-out variant they saw. Our resulting design recommendations are based on the qualitative and quantitative data captured through this large-scale online user study.

Icon and tagline recommendations:

- We recommend using the taglines "Privacy Options" to convey the broader concept of privacy controls. Our testing shows that this tagline strongly conveyed the idea that clicking on this link will lead to a place where users can make privacy choices, while at the same time it adequately conveyed that the link will lead to a place where users can opt out of the sale of their personal information. The "Privacy Choices" tagline was a close second for conveying these concepts.
- We recommend the "Do Not Sell My Personal Information" and "Do Not Sell my Info" taglines currently included in the CCPA legislation to convey the narrower concept of an opt-out for the sale of personal information. Our testing found that these taglines were commonly interpreted as links to controls over the sale of personal information.
- We recommend a toggle icon to accompany whichever tagline is required by the CCPA. This icon performed well in our testing, strongly conveying the idea of choices or settings.

 Do Not Sell My Personal Information

 Privacy Options

We do not recommend the use of an icon without an accompanying tagline. Our testing showed that none of the icons were meaningful without an accompanying tagline. If an icon is adopted and becomes widely recognized in the future, it should be re-evaluated to determine whether the icon has become sufficiently recognizable to be used without an accompanying tagline.

In this report, we outline our design and user evaluation methods, and provide supporting evidence for our final recommendations.

2. Opt-Out Icon

The first phase of our design and testing focused solely on the graphical element of the opt-out icon. While previous work has indicated that the choice of the text element is more crucial than the graphical element [15], a graphical element can aid discoverability because it may stand out more than text and be recognized quickly [12]. We wanted to identify a graphic that would be

recognizable to consumers and not create strong misconceptions about the purpose of the opt-out. After an initial ideation process, we conducted multiple rounds of testing and refinement to identify multiple icon graphics appropriate for a CCPA opt-out mechanism.

2.1 Background Research & Icon Ideation

Historically, a range of stakeholders from industry design practitioners to academics (e.g., [5, 24, 30] have attempted to translate various privacy concepts into graphical icons. As an initial step, we considered whether any existing icons would appropriately communicate concepts related to the opt-out of the sale of personal information. Discovery of existing privacy icon sets occurred through a review of academic papers and web content on the topic,[1] and existing knowledge of such efforts. After reviewing existing icon sets, we focused on icons associated with concepts that were aligned with the CCPA opt-out for the sale of personal information, which include the general notion of *privacy choice*, the action of *opting out*, and the practice of *sale of personal information.*

We then conducted two design workshops within our organizations to generate preliminary icon design ideas to visually communicate the opt-out of the sale of personal information. At the beginning of the workshop, participants were provided with a brief overview of the CCPA, as well as the required "Do Not Sell My Personal Information" opt-out link and optional logo or button. The workshops consisted of guided exercises centered around broad concepts related to the CCPA opt-out for the sale of personal information. Participants were provided with markers and sticky notes to complete the exercises. At the beginning of each exercise, a moderator instructed participants to sketch or describe as many ideas as they have related to the concept. After some time for brainstorming, ideas were discussed as a group. The research team then conducted affinity diagramming to group similar ideas and identify themes [18]. Through this exercise the following themes emerged that might be used in an icon design:

- a toggle or checkbox choice,
- changing a checkbox choice,
- withdrawing or removing something (i.e. opting-out),
- no exchange of personal info for money, and
- no/stop sale [of personal info].

We refined these icon concepts with the assistance of design students. Some of the concepts selected conveyed "do not sell my personal information," while others were more related to "choices about the use of your personal information." We were interested in the concept of "choices" because we believe that an icon for the CCPA opt-out could be used to also represent additional privacy-related choices consumers can make, not just a "do not sell" option.

We worked with a graphic designer who provided several variations of each icon concept, which typically differed in the shape or size of icon components. Some initial concepts were eliminated

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[1]A list of the icon sets explored is provided in Appendix A.

because the study team felt that they were too detailed to be understandable when sized down to the context in which they would appear. We iterated on the icon concepts and ultimately identified 11 icons for our first round of testing. We also included the DAA's Privacy Rights icon[2] in our test set, which is a green variant of the DAA's blue AdChoices icon[3] that the DAA is promoting as an icon for the CCPA opt-out.

2.2 Evaluation Method

We evaluated how people interpreted candidate icons by conducting two rounds of online user testing in December 2019 and early January 2020. Through these online tests we identified two icons (in addition to the Privacy Rights icon) to include in our larger-scale validation testing.

The study team developed a survey instrument[4] to capture qualitative and quantitative data about which icons would be most understandable as a "do not sell" opt-out. Each participant was shown one icon from the test set at random and asked to provide their interpretation of the icon, as well as their expectations as to what would happen if they clicked on it. To examine the impact of a text tagline, half of the participants saw this icon displayed with the text "Do not sell my personal information," while the other half saw the icon without any text displayed. After providing open-ended responses for a single icon, participants were then shown all icon candidates and asked to select which icons from the entire candidate set would best represent an option to tell websites "do not sell my personal information." They were also asked which would best represent an option to make choices about the use of their personal information. For both questions, participants were asked to explain their selections through an open-text response. We also asked all participants about their familiarity and expectations with respect to the DAA's blue AdChoices icon, which DAA partners have been using since 2011 to enable consumers to opt-out of behavioral tracking for online ads. We included these questions to evaluate the recognizability of an already widely deployed privacy opt-out icon. Lastly, participants provided their demographic information.

To analyze the data collected in both rounds of testing, we followed a systematic qualitative data analysis approach to categorize all qualitative data provided by participants [14]. For each open-ended question in the survey, a member of the study team first examined a small subset of the data to identify common themes observed. These initial "codebooks" were then discussed collaboratively and iterated upon, with themes or "codes" being added or modified as necessary [5]. One of the researchers then used these codebooks to categorize all participant responses according to the identified themes. While the vast majority of participant responses mapped clearly to a code, those that were more ambiguous were discussed by multiple team members prior to being labelled. In addition to identifying important misconceptions, the qualitative data

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[2] https://digitaladvertisingalliance.org/license-pricon
[3] https://youradchoices.com
[4] The full set of survey questions for the opt-out icon study are included in Appendix B-1.
[5] The codebook used for the opt-out icon study is included in Appendix C-1.

collected is used in our statistical analysis to report any significant differences between study conditions.

2.3 Round 1 Icon Test

To focus solely on the recognizability of the shapes, all candidate icons were tested in black and white. We also included the DAA's Privacy Rights icon[6] in our test set, rendered in green. The full icon set included in our initial testing is displayed in Figure 1. We selected the *toggle*, *changed-choice,* and *doNot-checked* icon to represent the ability to make choices. We selected the *circle-arrow, box-arrow,* and *folder-arrow* icons to represent something being removed from (opted-out of) a hole, box, or folder respectively. We selected the *ID card*, *profile, slash-dollar, doNot-dollar,* and *stop-dollar* icons to represent stopping the sale of personal information. The *ID card* and *profile* depict a person along with stopping sale, while the other three focus only on stopping sale, using three different symbols associated with stopping (slash, do-not-enter sign, and stop sign).
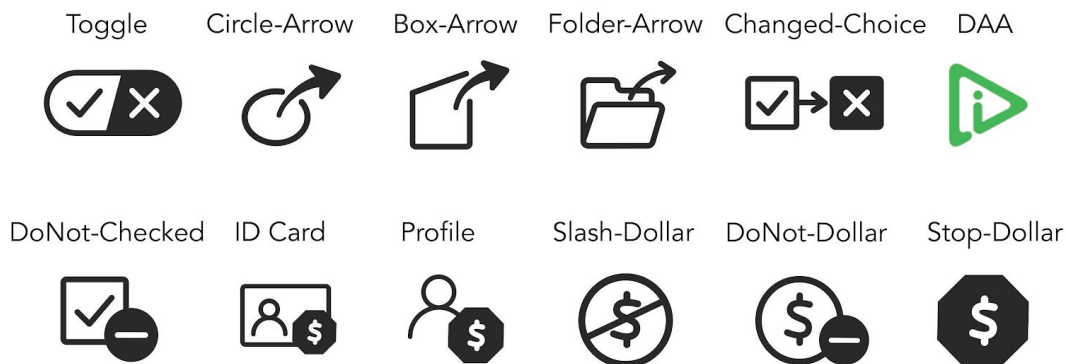

Figure 1: Icons studied in the round 1 test

We recruited 240 participants through Amazon's Mechanical Turk service[7] to complete our online test, and compensated participants $1.00 for their response.[8] Participants were required to be residents of the United States over the age of 18 and have a high approval history on Mechanical Turk to be eligible to take the survey.

The demographic information we collected indicated that our study population was fairly diverse, but not U.S.-census representative. Our participants skewed younger, more male, and more educated than the general U.S. population. Participants reported being residents of 40 different states, with 11.3% reporting residence in California. Our study population was also fairly tech savvy, with 38.8% reporting that they have an education in, or work in, the field of computer science, computer engineering or IT. Only 11 participants (4.6%) reported that they were aware

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[6] The green version of the DAA's icon was presented to participants who were randomly assigned to evaluate this icon from the set. A non-colorized version was included as an option when participants selected an icon from the full icon set to ensure that color was not a factor in participants' decisions.
[7] Amazon Mechanical Turk is a crowdsourcing service commonly used in academic research.
[8] Compensation was prorated to a wage of $12.00/hr based on estimated survey completion time.

of a law in the U.S. that required companies to provide a "do not sell" option, but none explicitly mentioned the CCPA when asked to name or describe the law.

As shown in Figure 3, when asked to select the best icon to represent the "do not sell" concept from among all icon candidates, participants had a clear preference, with 37.5% of participants selecting the *slash-dollar* icon. The *ID card* and *profile* icons were the next most preferred. From their qualitative responses, the features that participants seemed to focus on the most were those that communicated the concepts of "money" or "selling" (108 participants), "stop" or "do not" (102), and "personal information" (46). While the "$" symbol represented the concept of "selling" well, participants seemed to prefer the circle with a slash representation of "do not" over an octagonal stop sign representation, or a do-not-enter sign representation, as indicated by the difference in preferences for *slash-dollar*, *stop-dollar,* and *doNot-dollar*.
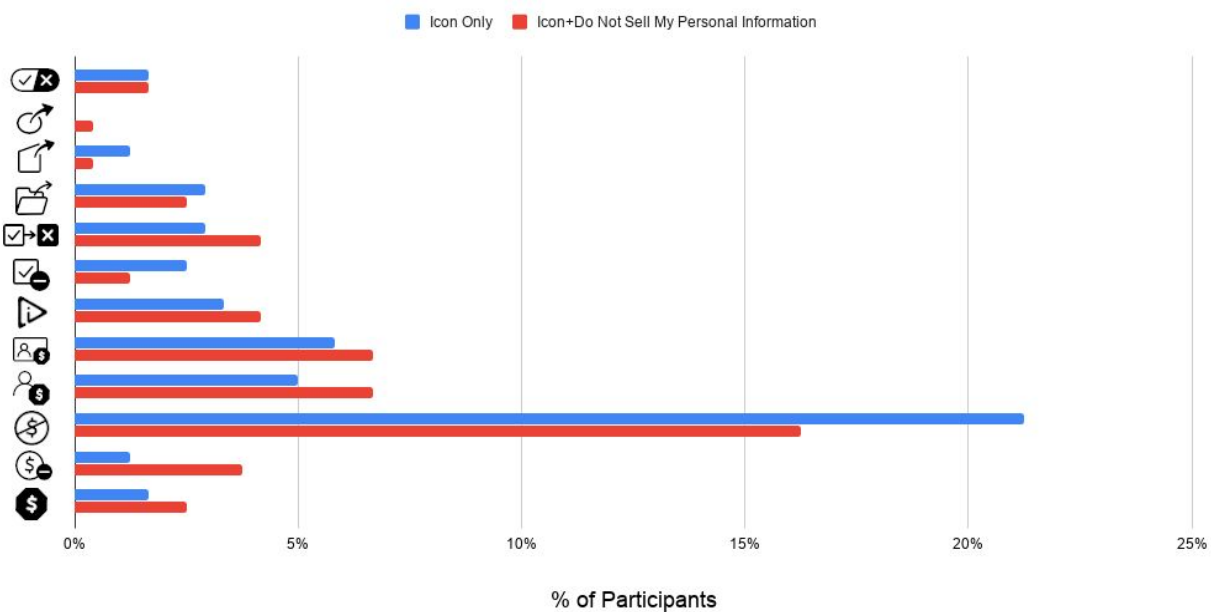

Figure 3: Participants' preferred icon for "do not sell my personal information"

When asked about which icon best represents choices about the use of personal information more generally, participants were more divergent in their opinions, as seen in Figure 4. The *toggle* icon had the most votes, though four other icons were not far behind. According to the qualitative responses, despite not being strongly preferred, *toggle* was much more strongly associated with the concepts of choosing, selecting, or choice than the other icons. The icon features that participants focused on the most were those that they felt communicated "personal information" (46 participants), "money" or "selling" (44), "select" or "choose" (42), and "stop" or "do not" (38). It seems that participants were primed to think about a "do not sell" choice from

the previous question or tagline (if it was shown), leading to more selections of symbols with "$" than there probably otherwise would have been.

Which of these symbols do you think best conveys that there's an option to make choices about the use of your personal information?
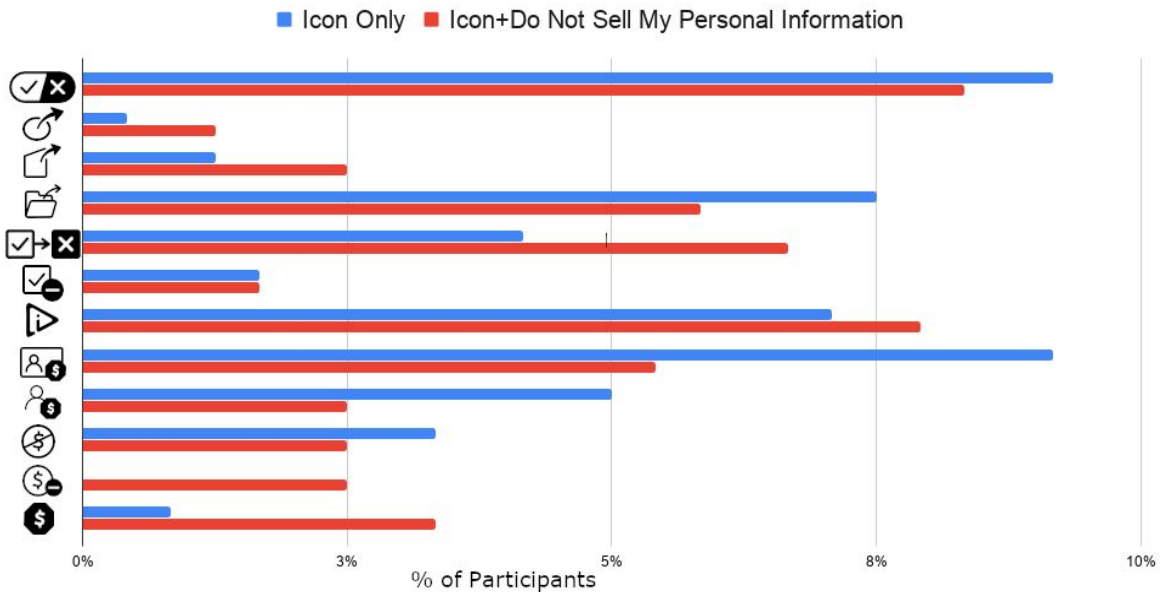
Figure 4: Participants' preferred icon for "choices about the use of your personal information"

As is to be expected for a new icon design, participants had difficulty interpreting what the icons intended to convey without further context. Icons with arrows (e.g., *circle-arrow, box-arrow,* and *folder-arrow*) were particularly confusing to participants and no participants suggested that they were related to a choice. Participant responses also indicated that the diagonal slash representation was well understood as "do not do something." Additionally, some participants found the octagon shape hard to recognize as a "stop" sign without color. The "do not enter" sign also was sometimes not recognized, or was misidentified as a minus sign. The concept of personal information was also difficult to convey, though the *ID card* icon was most promising.

In selecting icons for further evaluation, we considered several of our preliminary findings. The *slash-dollar* icon was participants' preference for a "do not sell" icon. Additionally, participants selected the *toggle* and *ID card* icons in roughly equal numbers for an icon related to "choices about the use of your personal information." Though other icons also received a large number of votes, they were difficult for participants to interpret. Icons with an octagonal stop sign (*e.g.,* the *stop-dollar* icon) were also difficult for participants to interpret, though we hypothesized that a colorized version with a red stop sign might perform better in further testing.

2.4 Round 2 Icon Test

After analyzing the data collected from our first round of testing, we worked with our graphic designer to refine the four icons we thought were most promising, as shown in Figure 2. Specifically, we considered different coloring options for the *toggle* and *slash-dollar* icons, different "$" shapes for *slash-dollar* icon, and colored the stop sign red in the *ID Card* and *stop-dollar* icons. We selected a bright blue color for the *toggle* icon because blue is a neutral color that will stand out against black text. Since a toggle can be in two states, we did not want to use colors like green and red that might convey a particular state.
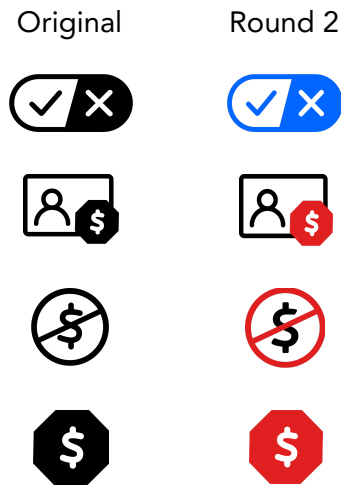
Original   Round 2

Figure 2: Icons tested in round 2 and their original versions.

We re-used the previously designed survey instrument to evaluate these icons, as well as the DAA's Privacy Rights icon, on Amazon's Mechanical Turk, and collected survey responses from another 280 participants. To mitigate a potential priming effect that we may have observed in the first round of testing, we randomized the order of the icon selection questions which asked participants to select which icon from the full set best represented options for "do not sell" or more generally "privacy choices." The demographics of these participants were similar to those reported by our initial participant population. However, only three participants (1.1%) in this sample were aware of a new California privacy law.

2.4.1 Clear preference for "do not sell" opt-out and privacy choices icons

As shown in Figure 5, when asking Round 2 participants to select the best icon to represent the "do not sell "concept from among the icon candidates in round 2, participants had a clear preference, with 49.6% of participants selecting the *slash-dollar* icon. From their qualitative responses, the features that participants seemed to focus on the most were those that communicated the concepts of "stop" or "do not" (133 participants) followed by "money" or "selling" (113) and "personal information" (51). This increase in focus on stopping may have

been a result of adding color to the icons, as the red do-not and stop signs may have become more prominent.

In contrast to our initial testing, when asked about which icon best represents choices about the use of personal information more generally, participants also exhibited a clear icon preference, as seen in Figure 6. The *toggle* icon was most preferred, performing much better than any of the other icons. The votes for the *DAA* icon and *ID card* icon were comparable to those they received in our first round of testing. Forty-five participants explicitly stated that a ✓ and ✖ toggle was a good representation of choice. Other icon features that participants focused on the most were those that they felt communicated "do not/deny" (64 participants), "allow" (50), "personal information" (44), and "money/selling" (31). As in our previous test, participants who were shown a tagline may have been primed to think about "do not sell," leading to more selections of symbols with "$" than there probably otherwise would have been.
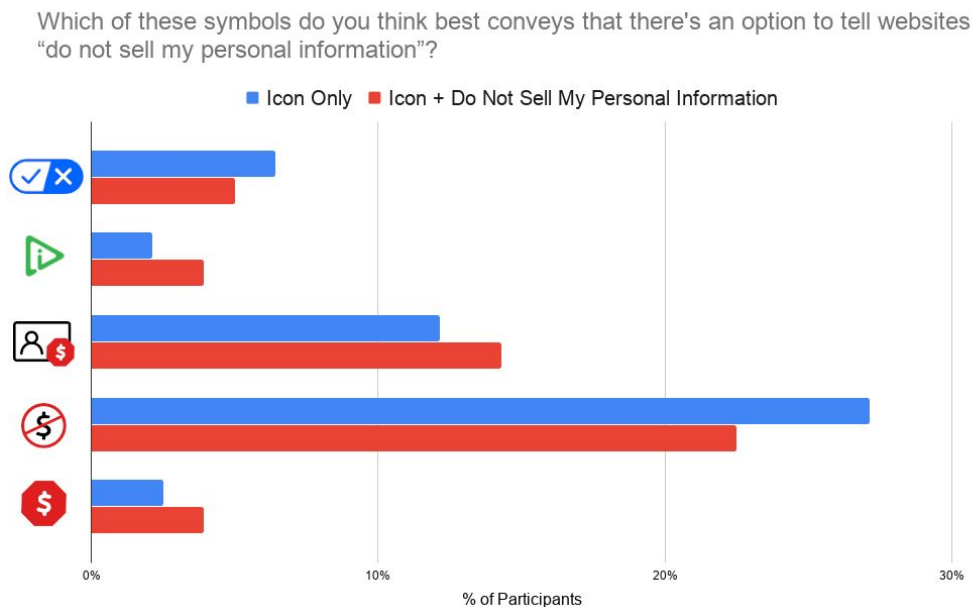

Figure 5: Participants' preferred icon for "do not sell my personal information"

Which of these symbols do you think best conveys that there's an option to make choices about the use of your personal information?
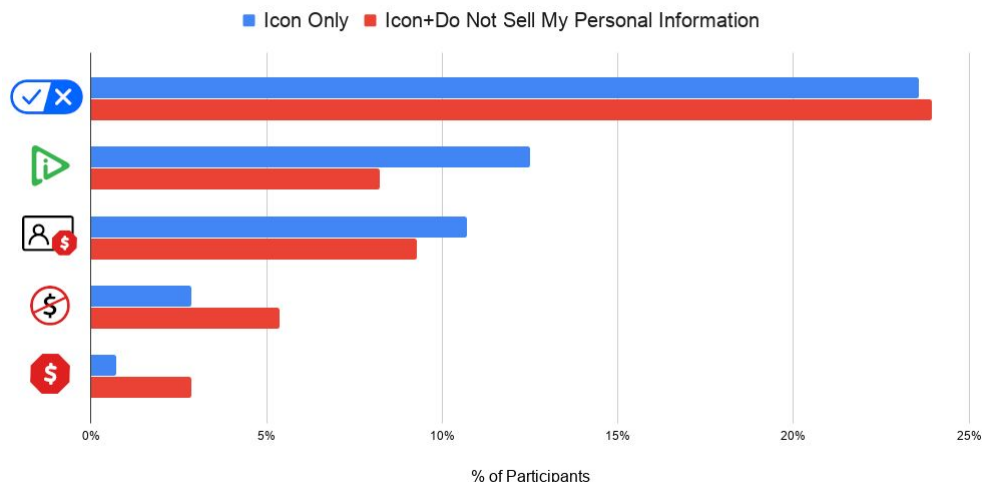
Figure 6: Participants' preferred icon for "choices about the use of your personal information"

2.4.2 Icons without a text tagline were commonly misinterpreted

Table 1 provides common interpretations of each icon when displayed without a text tagline. As is to be expected for a new icon design, participants had difficulty interpreting what these icons intended to convey without further context. For example, common interpretations of the *slash-dollar* icon, which was the preferred icon from the set for a "do not sell" opt-out, were that "something is free or does not require money" or that "cash or American dollars were not accepted." In contrast, participants who saw the *ID card* icon interpreted it as "something costs money." Participants also associated the *stop-dollar* icon with "money" generally, but many could not pinpoint exactly what was related to money. Promisingly, the *toggle* icon was interpreted more in line with its intended meaning as an option to "accept/decline" or "activate/deactivate" something. The *DAA* icon conveyed an option to "get more information," but did not suggest choice or an opt-out option to participants. A Fisher's Exact Test confirmed that there was a significant difference between icon conditions on whether or not participants had a correct interpretation of the icon ($p < 0.001$, Cramer's V = 0.63). Pairwise comparisons, adjusted with Holm-Bonferroni corrections[9], found that the *toggle* icon was more likely to be interpreted correctly compared to other conditions (all $p < 0.001$).

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[9] For all pairwise comparisons in our analysis, we applied Holm-Bonferroni corrections, since we have no prior hypotheses about the findings and would like to adopt a fairly conservative multiple comparisons adjustment to mitigate over-optimism in p-values.

Icon	Common Interpretations (# of participants)
Toggle	● **accept/decline something (11)** ● **activate/deactivate something (5)** ● okay/exit options (4) ● mark as true/false (4)
DAA	● get more information (15) ● start audio/video content (7) ● denotes website is safe or private (3) ● move forward or next (2) ● something related to ads (1)
ID card	● something costs money (10) ● sending money to someone (4) ● account balance related (4) ● payment methods accepted by website (2) ● **something related to a person and money (3)** ● price related (2) ● receiving money from someone (2)
Slash-dollar	● something is free or requires no money (12) ● cash/dollars not accepted (7) ● money (4) ● **selling is not allowed (1)**
Stop-dollar	● money (14) ● price related (6) ● stop spending money (5) ● something costs money (2) ● stop (2)

Table 1: Summary of responses to "What does this symbol communicate to you?" from participants who saw icons without taglines (bolded lines mark an intended interpretation)

2.4.3 Icons with taglines clearer, but still misinterpreted

The presence of a tagline led to a significant increase in correctly interpreting the icon ($p < 0.001$, $\Phi = 0.64$). Of those who were shown an icon graphic with the "Do not sell my personal information" tagline, 49.3% (69) interpreted it to mean that there was a choice available that allowed them to communicate to websites to not sell their personal information. Twenty-five of these participants expected that the icon/tagline would lead to another page with choices about the sale of their personal information, and 44 thought clicking on the icon/tagline would directly apply the "do not sell" opt-out. There was no significant difference between icons in creating either of these expectations, suggesting that the text tagline is what impacted participants' expectations rather than the icon.

Some thought that clicking on the icon/tagline would lead them to a different type of privacy choice, such as opting out of data collection on the website. Concerningly, a few participants were skeptical that companies would honor a "do not sell" request, or stated that they would not click the icon/link if they saw it on a website. Others misinterpreted the icon and tagline as a warning not to give out their personal information to websites.

2.4.4 AdChoices icon still mostly unknown

Only 40 (14.3%) of participants recalled seeing the DAA's blue AdChoices icon before. However only eight participants recognized it as something that would lead to advertising choices, while another five participants related it to online advertising in another way (e.g., something that leads you to the product in an online ad). The most common expectation was that the icon provided more information about something, as indicated by 153 participants. A 2011 study also found little recognition of the AdChoices icon [15].

2.5 Icon Recommendations

The CCPA icon needs to be accompanied with a text description. Our initial testing shows that the addition of a tagline has a major impact on how people interpret an icon. Additionally, our results regarding the AdChoices icon indicate that even when icons become more familiar, that familiarity does not necessarily translate to accurate interpretations (i.e., that it leads to privacy choices). In the most successful cases, without a text description participants correctly recognized concepts related to choice (the *toggle* icon), payment (the *slash-dollar* and *stop-dollar* icons), and stopping (the *slash-dollar* and *stop-dollar* icons*), but did not connect these with personal information. However it is important to also test the text description in addition to the icon, as it could create unintended interpretations. Our testing, for example, revealed that the text link "Do Not Sell My Personal Information" could lead many to believe that the opt-out is applied directly, rather than serve as a link to a page with an opt-out webform or additional choices.

To convey the presence of a choice, a toggle icon should be used. Our participants favored a *toggle* icon as a representation of choices over how websites can use their personal information. Even when the icon was tested alone, without being paired with a text tagline, the most common interpretations of a *toggle* icon indicated the ability to accept/decline or activate/deactivate something. Furthermore, a *toggle* icon did not lead to any misconceptions that were particularly problematic. In contrast, an icon featuring a "$" with a red slash over it was harder for participants to interpret and sometimes led to the expectation of seeing payment options, that cash or dollars are not accepted, or that something is free or requires no money. This icon did not lead to an association to the sale of personal information, or even choices more generally.

A toggle icon can represent privacy choices beyond a "do not sell opt-out." To accommodate potential future regulatory requirements related to the use of personal information and to signal that other privacy choices are available, an icon less specific to "do not sell" may

be appropriate for the context of a CCPA opt-out button/logo. In our first round of testing, a few of the candidate icons received approximately an equal number of votes to represent general choices related to the use of personal information. However, in the second round of testing differences began to emerge. It appears that adding color to the *ID card* icon drew more attention to the stop sign which could have made it less appealing as a representation of this concept. The *DAA* icon was commonly thought to lead to more information and did not create the expectation of being able to make or express a choice. Thus out of the icons tested, the *toggle* icon appears to be only one that could accommodate potential future controls related to privacy.

3. Opt-Out Link Text/Tagline

The results from testing the graphical component of a CCPA opt-out icon highlighted that it is necessary – at least initially – for such an icon to have a text description so that users understand that an opt-out choice is present. We conducted another set of usability tests to explore what this text description or icon tagline should be by asking users to evaluate 16 possible phrases, including those included in current CCPA regulations. From the results of this testing, we identified a smaller set of phrases to include in our large-scale evaluation.

3.1 Tagline Ideation

Leveraging the study team's expertise in privacy choice design, we developed an initial list of possible candidate icon taglines. This list included both versions of the required "do not sell" opt-out link mandated by section 999.315(a) of the proposed CCPA regulations, as well as abbreviated versions of the same phrase. Our testing of icon graphics also made it apparent that these phrasings may lead users to form incorrect expectations about what happens when the opt-out button/icon is clicked. Thus, we felt it was important to test the "do not sell" phrasing in conjunction with words that more strongly emphasized the presence of a user choice. To accommodate potential future regulatory requirements, the study team also developed taglines that could be generalized to other types of controls over the collection and use of online data. We first identified 14 taglines that revolved around the following six words or phrases: do not sell, personal info, privacy, choices, options, opt-outs. After a small initial user test, we eliminated four taglines from consideration, as they were not well interpreted, and added two more for a second round of data collection.

The taglines we considered in our evaluation were:
- t1: Do Not Sell My Personal Information [included in CCPA section 999.315(a)]
- t2: Do Not Sell My Info [included in CCPA section 999.315(a)]
- t3: Don't Sell My Info
- *t4: Do Not Sell
- *t5: Don't Sell
- *t6: Do-Not-Sell Choices

- t7: Do-Not-Sell Options
- *t8: Do-Not-Sell Opt-Outs
- t9: Privacy Choices
- t10: Privacy Options
- t11: Privacy Opt-Outs
- t12: Personal Info Choices
- t13: Personal Info Options
- t14: Personal Info Opt-Outs
- **t15: Do Not Sell My Info Choices
- **t16: Do Not Sell My Info Options

* Dropped from our second round of data collection
** Added for our second round of data collection

3.2 Evaluation Method

To evaluate how well each tagline was understood we designed and distributed an online survey in late December and early January 2020.[10] Participants were shown one of the 16 candidate taglines at random, which were styled as hypertext links.[11] We chose to represent the tagline text as links rather than an icon/text pairing since for this stage of testing we wanted to isolate interpretations of the tagline text from those of a potential icon that the text would be paired with. Participants were then asked open-ended questions to explain what they thought components of the tagline (i.e.,"personal info," "selling," "choices," "options," and "opt-out") were referencing. We also asked participants to describe their expectations of what they thought would happen if they clicked on the link. To capture quantitative data about common expectations uncovered in our icon testing, we asked participants to rate on a five-point scale how likely they thought it was that the link would lead to each of eight scenarios. Participants were also asked about their familiarity with the CCPA and to provide their demographic information.

We recruited 540 participants[12] in total (140 in the first round and 400 in the second round) through Amazon's Mechanical Turk service to complete our online survey, and compensated participants $1.00 for their response. Participants were required to be residents of the United States over the age of 18 and have a high approval history on Mechanical Turk to be eligible to take the survey. The demographic information we collected indicated that our study population was fairly diverse, but not U.S.-census representative. Our participants skewed younger, more male, and more educated than the general U.S. population. Participants reported being residents of 45 different states, with 12.4% reporting residence in California. Our study population was also fairly tech savvy, with 36.9% reporting that they have an education in, or work in, the field of computer science, computer engineering or IT. Sixteen participants (3.0%)

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[10] The full set of survey questions for the opt-out link text/tagline study are included in Appendix B-2.
[11] Though the taglines were styled as a hypertext link, they were not actually clickable in our survey.
[12] 48 responses were excluded from our analysis since these responses included nonsensical text to all open-ended questions in the survey.

reported that they were aware of a law in the U.S. that required companies to provide a "do not sell my personal information" option, but only nine (1.7%) explicitly mentioned the CCPA or California when asked to name or describe the law.

We followed the same qualitative data analysis approach used in our icon testing to categorize all open-ended responses provided by participants[13]. In addition to the quantitative data collected on a five-point rating scale, our statistical analysis utilizes the coded qualitative data to identify differences between study conditions.

3.3 Tagline Results

Next we provide a summary of our findings related to the different phrases examined, including our rationale for narrowing down our initial test set of 14 taglines. From these results we identified three candidate phrases as an alternative to those included in current CCPA to further consider in our final evaluation.

3.3.1 Round 1 Elimination

In examining the qualitative data, we observed that the word "sell" on its own was often misunderstood. As seen in Figure 7, without an explicit reference to "personal info" or "info" in the tagline, participants had difficulty recognizing that the word "sell" in the tagline referred to the sale of personal information. The most common interpretation reported by participants who saw one the taglines "Do Not Sell," "Don't Sell," or one of the "Do-Not-Sell" variants was that the link referred to the sale of some sort of a physical product, as reported by 17 participants. Four thought it was related to stocks or money and five did not know what type of selling the link was referring to. A few participants suggested that it was related to the sale of a sample product or something marked as "not allowed for individual sale." Considering that participants did not see these links in the context of a real website, it is not surprising that such misconceptions occurred. However, it indicates that not all users will automatically relate "sell" to the sale of personal information.

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[13] The codebook used for the opt-out link text/tagline study is included in Appendix C-2.
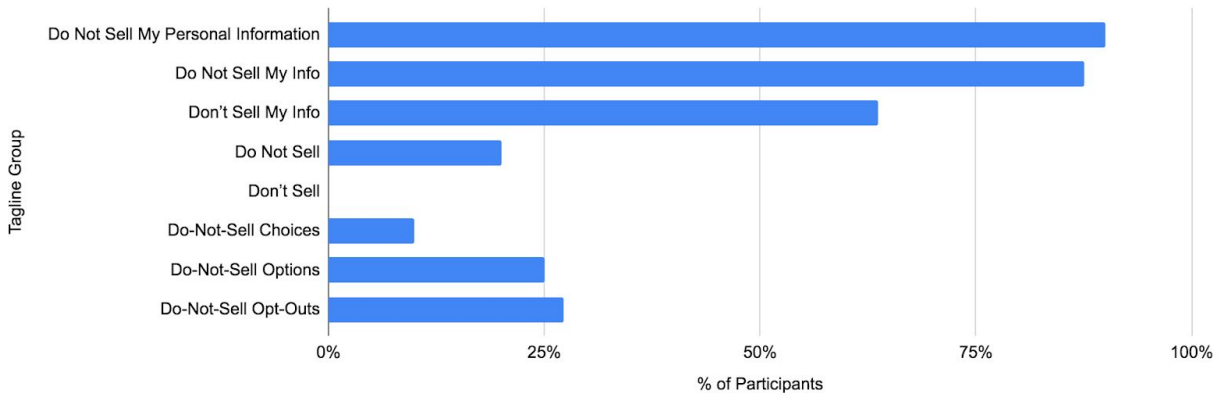
Figure 7: Responses to the question "What type of selling do you think this link refers to?" that mentioned personal information

We also observed that the prefix of the tagline (i.e. Do-Not-Sell, Privacy, Personal Info) appears to have greater impact than the tagline suffix (i.e.. Choices, Options, Opt-outs). As seen in Figure 8, more participants provided responses that indicated an understanding that the link would lead to some type of control related to the collection, use, or sale of their personal information when shown a tagline with the prefix "privacy" over those who saw a tagline with "do-not-sell" or "personal info."
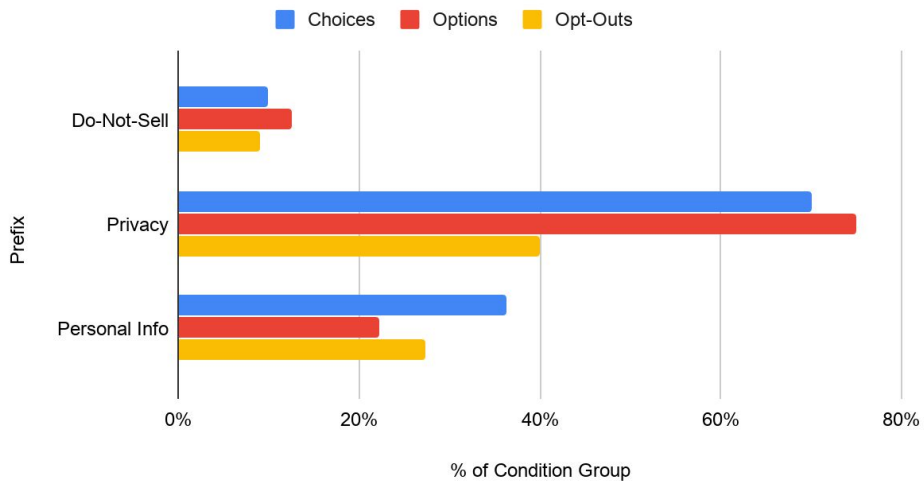
Figure 8: Responses to "What types of [choices/options/opt-outs] do you think this link refers to?" that mentioned a control related to the collection, use, or sale of their personal information (or privacy related controls more generally)

From these initial results, we concluded that taglines that included only the word "sell" without "info" or "personal info" would not be appropriate for the context of a CCPA opt-out. Thus, we eliminated four respective taglines from our further testing, retaining only "Do-Not-Sell Options."

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We added two additional taglines "Do Not Sell My Info Choices" and "Do Not Sell My Info Options" to our test set to assess how adding these suffixes would affect the performance of the CCPA required taglines. We chose not to test "Do Not Sell My Info Opt-Outs" as we believed it would have similar or worse performance compared to these taglines, given the taglines already tested.

3.3.2 Interpretations of "Personal information"

The phrase "personal information" was largely accurately interpreted as personally identifiable information. When asked to interpret this phrase, 50.6% across both sets of participants responded with or listed examples of personally identifiable information. We observed no statistical difference between tagline conditions that contained the word "info" or "information." As seen in Table 2, "personal information" was also commonly thought to refer to demographic information, past activities on the website or elsewhere, location data, and financial information.

Category	Examples	R1 Responses	R2 Responses
Personally identifiable information	Name, address, birthday	55.0%	49.6%
Demographic info	Age, gender	18.3%	28.9%
Past activities	Browsing history, purchases	16.7%	17.8%
IP address/location		15%	9.6%
Preferences	Political opinions	13.3%	10.4%
Financial info	Credit card, bank information	10%	10%
Everything and anything		6.7%	4.4%
User profile info	Info submitted to the website	1.7%	8.5%
Medical info	Prescription history	1.7%	1.5%
Other		10%	9.6%

Table 2: Categorization of round 1 (R1) and round 2 (R2) responses to "What types of personal information do you think this link refers to?"

3.3.3 Taglines That Created Intended Expectations

After coding the common themes emerging in participants' expectations of what would happen when they clicked, we grouped these themes into three categories (incorrect, semi-correct, and correct) according to what could happen on a website under current CCPA regulations (i.e., the user is brought to a notice of their right to opt-out from the sale of personal information). Overall, 33.3% of participants who saw a tagline condition included in our second round of testing had a

correct expectation of what the link led to. Examples included choices about privacy, an unspecified opt-out choice, and choices or additional information related to the sale of their personal information. Another 37.3% had a semi-correct expectation. Examples included the expectation that the website would not sell their personal information as soon as the link is clicked, or something less specific, such as more information or a page related to privacy. As seen in Figure 9, the distribution of correct, semi-correct, and incorrect responses were not evenly distributed across different tagline conditions. This was confirmed with a Fisher's Exact Test (p < 0.001, Cramer's V = 0.33). Follow-up pairwise comparisons, adjusted with Holm-Bonferroni corrections, revealed that the taglines "Privacy Choices" and "Privacy Options" were significantly better than most other conditions, including the CCPA's abbreviated "Do Not Sell My Info" option.[14]

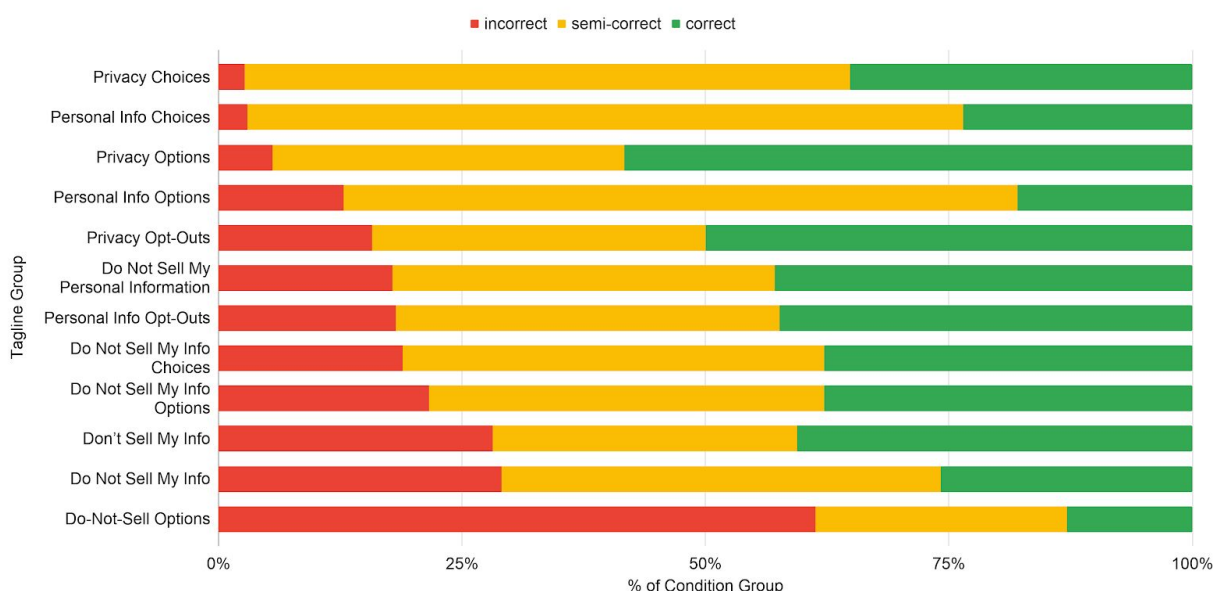Distribution of Expectations Across Tagline Conditions

Figure 9: Distribution of correct, semi-correct, and incorrect expectations categorized from responses to "What do you think would happen if you clicked this link?"

For further statistical analysis, we included semi-correct responses in the correct category since most semi-correct responses (e.g., the expectation to see more information about the website's data practices) were within the realm of possibility and did not include misconceptions technically speaking. By treating semi-correct responses as correct responses, "Personal Info Choices" emerged as one of the best taglines in leading to correct expectations in addition to "Privacy Choices" and "Privacy Options," significantly outperforming "Do Not Sell My Info" "Don't

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[14] Specifically, "Privacy Choices" was significantly better than "Do Not Sell My Info," "Don't Sell My Info," "Do-Not-Sell Options," "Personal Info Choices," "Personal Info Options," and "Do Not Sell My Info Options." "Privacy Options" was significantly better than "Do Not Sell My Info," "Do-Not-Sell Options," "Personal Info Choices," and "Personal Info Options." There was no significant difference between "Privacy Choices" and "Privacy Options."

Sell My Info" "Do-Not-Sell Options" in pairwise comparisons (p = 0.03, p = 0.03 and p < 0.001 respectively).

We ran a binomial regression to examine the impact of the presence of particular words or phrases on participants' correct or incorrect expectations. Participants' age, gender, education and technical expertise were also included in the regression model as control variables. We found that the presence of the word "sell" in the tagline decreased the odds of participants having a correct expectation of what the link would lead to (odds ratio [OR] = 0.11, p < 0.001). This suggests that participants may not yet be familiar with the idea of having a choice related to companies' sale of their personal information, and thus did not associate the phrase they saw with such an option.

The responses binned as "incorrect" revealed several misconceptions related to the taglines we included in our second round of testing. Eighteen participants thought the link would bring them to a phishing website or malware, while 14 thought that clicking the link would enable tracking or sharing of their personal information. Nine participants expected the link they saw to lead to more information about selling products, while another nine thought they would be led to advertising for privacy or security products and services. Eight participants thought clicking the link would lead them to advice about investments (such as stocks). A total of nine participants expected that clicking the link would do nothing.

3.3.4 Benefits and Drawback of Current CCPA Taglines

To examine which elements of the taglines tested were best at communicating the do-not-sell requests, we ran another binomial regression model with participants' open-ended responses about expectations coded as a binary variable: whether or not the responses were related to the ability to opt out of selling personal information. As with the previous model described, participants' age, gender, education and technical expertise were included in the regression model as control variables, while indicator variables for individual phrases or words (e.g., "sell") were key independent variables. We found that seeing the words "sell" and "opt-out" in a tagline increased the odds that a participant expected a "do not sell" choice (sell: OR = 45.85, p < 0.001; opt-out: OR = 19.57, p = 0.008). Using a similar method, we explored which elements in the taglines were best at communicating the concept of privacy more generally. We found that the presence of "sell" decreased the odds of privacy choices being conveyed (OR = 0.18, p < 0.001). **This suggests that current CCPA taglines were better than the others we tested in conveying choices specifically related to the sale of personal information, but were not as effective in conveying privacy choices more generally.**

When asked about specific scenarios derived from responses in our icon testing, the taglines currently required in the CCPA regulations (as well as the related variant "Don't Sell My Info") seem to imply that clicking on the link would immediately apply a "do not sell" opt-out. Across data collected from both rounds, about half of participants who saw one of the two CCPA links thought that this means the immediate application of a "do not sell" opt-out would "probably" or "definitely" happen, which will likely not be the case in practice. Another scenario that over a

quarter of participants who saw the CCPA or related taglines thought "probably" or "definitely" would happen is that the link will take you to a page where you can pay to protect your personal information. Though the differences between tagline conditions in expecting these two scenarios was not significant, this suggests that users may have different expectations of the CCPA-required link that do not exactly align with how websites are implementing this new privacy choice.

3.4 Tagline Recommendations

Avoid further abbreviating the current CCPA opt-out link text. Our results highlight that without an explicit reference to "personal info" or "my info" in the tagline (e.g. "Do not sell" and "Don't sell") participants had difficulty recognizing the tagline as an opt-out choice. Instead, participants thought the tagline pertained to the sale of a physical product and expected the link to lead to more information about products sold on the website. Others had no guesses as to what type of selling the link referred to.

Broaden the CCPA opt-out link text to better accommodate user mental models. Our testing revealed that "personal information" may be too limited in scope to incorporate the types of user data covered by CCPA requirements. The majority of participants who saw a link with the phrase "personal information" only considered types of personally identifiable information, such as name or birthday, rather than a more holistic view of the data collected about them (e.g., viewed products, "likes", and other interactional, transactional or behavioral data). The term "privacy" on the other hand, when paired with any of the three suffixes tested, seemed to better match participants' expectations to intended opt-out functionality. This may be because people have now become familiar with privacy notices and privacy user account settings being available on websites.

4. Opt-Out Icon + Tagline Combination

We conducted a final larger-scale study to examine what would be the best combination of graphical icon and tagline in conveying (1) opt-outs for the sale of personal information, and (2) privacy controls beyond do-not-sell choices. Results from our icon testing showed that participants had a clear preference for the *dollar-slash* icon as a "do not sell" icon, and the *toggle* icon as an icon to convey choices related to the use of one's personal information. Our tagline testing highlighted that the current CCPA taglines ("Do Not Sell My Personal Information" and "Do Not Sell My Info") were better than other taglines in conveying choices specifically related to the sale of personal information. However, "Privacy Choices" and "Privacy Options" were more effective in conveying privacy more generally; these two taglines in addition to "Personal Info Choices" led to fewer misconceptions compared to the other taglines we tested. Moreover, our testing suggests a need for the joint presence of a graphical icon and tagline. Icons alone do not necessarily translate to correct expectations, even with a certain degree of familiarity (e.g., in the case of the AdChoices icon). Text description alone may also create

unintended expectations, e.g., users could believe an opt-out is applied already upon seeing "Do Not Sell My Personal Information." Adding an icon next to it might more successfully convey the idea that the link would lead to related choices rather than immediate execution of the opt-out.

To capture the potential interaction effects between icons and taglines, and to examine the impact of having just an icon or just a text link, we utilized a near fully-factorial experimental design[15] which included four icon conditions and six tagline conditions (a total of 23 conditions). The four icon conditions included were the DAA's Privacy Rights icon, the *slash-dollar* icon, the *toggle* icon, and no icon. The six tagline conditions were "Do Not Sell My Personal Information," "Do Not Sell My Info," "Privacy Choices," "Privacy Options," "Personal Info Choices," and no tagline.The full set of conditions is provided in Table 3.

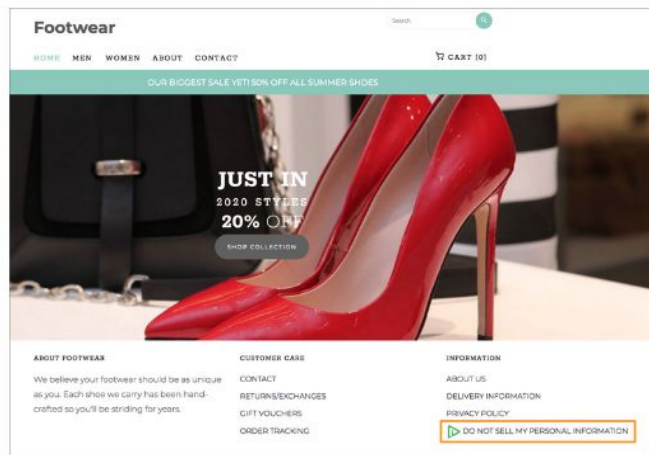|	DAA icon	Toggle icon	Slash-Dollar icon	No Icon
Do Not Sell My Personal Information	daa-Do Not Sell My Personal Information	toggle-Do Not Sell My Personal Information	dollar-Do Not Sell My Personal Information	none-Do Not Sell My Personal Information
Do Not Sell My Info	daa-Do Not Sell My Info	toggle-Do Not Sell My Info	dollar-Do Not Sell My Info	none-Do Not Sell My Info
Privacy Choices	daa-Privacy Choices	toggle-Privacy Choices	dollar-Privacy Choices	none-Privacy Choices
Privacy Options	daa-Privacy Options	toggle-Privacy Options	dollar-Privacy Options	none-Privacy Options
Personal Info Choices	daa-Personal Info Choices	toggle-Personal Info Choices	dollar-Personal Info Choices	none-Personal Info Choices
No Tagline	daa-none	toggle-none	dollar-none	excluded

Table 3: Matrix of the 23 study conditions explored in our final evaluation.

4.1 Evaluation Method

Similar to our previous testing, we conducted a between-subjects study and showed participants a single icon-tagline combination at random. We then asked follow-up questions to explore which combinations best conveyed that a do-not-sell opt-out or privacy choice is present. In contrast to our previous testing, the icon-tagline condition participants saw was placed in the context of a website for a fictitious online shoe retailer called "Footwear." Relative to how participants were shown the icons or text links in our previous surveys, contextualizing

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[15] As the combination of "no icon" and "no tagline" would mean participants would not be exposed to any CCPA-specific information, this condition was excluded from our otherwise full-factorial design.

the icon and text link in this manner more accurately represents how users are likely to see the CCPA opt-out in the real world. As shown in Figure 10, participants were shown a screenshot of Footwear's website with the opt-out icon and tagline placed in the footer of the website under the link to the website's privacy policy, which is expected to become common practice under CCPA. To ensure participants were able to read the text link within the survey, we highlighted the icon and tagline with an orange box and displayed a close-up of just the icon and tagline portion of the website.

Figure 10: Screenshot of what participants assigned to condition daa-Do Not Sell My Personal Information saw within the survey platform Qualtrics.

The set of questions participants answered was similar to those asked in our tagline study.[16] Participants were first asked to describe their expectations of what they thought would happen if they clicked on the icon/phrase that was contained in the orange box on the webpage. Those who were assigned to a condition with a text tagline were then asked open-ended questions to explain what they thought different components of the tagline (e.g., "sell") meant in the phrase

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[16] The full set of survey questions for the opt-out icon + tagline combination study are included in Appendix B-3.

they saw. Additionally, we derived eight specific scenarios which the user might expect after clicking the symbol or link, based on participants' open-ended responses in the tagline study. These scenarios concerned the expectation of do-not-sell choices, choices about how personal information is used or shared, or misconceptions such as phishing or malware risks, and causing the website to send unwanted emails. For each scenario, we asked participants to indicate whether it is "definitely not" "probably not" "not sure" "probably" or "definitely" to happen. As with our previous testing, participants were asked about their familiarity with the CCPA and to provide their demographic information.

For this final evaluation in late January 2020, we recruited 1,416 participants[17] through Amazon's Mechanical Turk to complete our questionnaire, and compensated participants $1.00 for their response. Participants were required to be residents of the United States over the age of 18 and have a high approval history on Mechanical Turk to be eligible to take the survey. As with our previous study populations, the demographic information we collected indicated that our sample was fairly diverse, but not U.S.-census representative. Our participants skewed younger, more male, and more educated than the general U.S. population. Participants reported being residents of all 50 U.S. states as well as Washington D.C., with 10.2% reporting residence in California. Our study population was also fairly tech savvy, with 20.6% reporting that they have an education in, or work in, the field of computer science, computer engineering or IT. Relative to our previous study samples, there was a small increase in awareness of the CCPA as 84 participants (5.9%) reported that they were aware of a law in the U.S. that required companies to provide a "do not sell my personal information" option and explicitly mentioned the CCPA or California when asked to name or describe the law. Of these participants, 18 reported residing in California. This increased awareness is likely due to the timing of our data collection for this study, which occurred about three weeks after CCPA went into effect.

To categorize all open-ended responses provided by participants, we followed the same qualitative data analysis approach used in our testing of icons and text taglines.[18] As with our analysis of text taglines, our statistical analysis utilizes the qualitative data to identify differences between study conditions in addition to the quantitative data collected on a five-point rating scale.

4.2 Icon + Tagline Combination Results

Next, we present a summary of findings related to the 23 conditions tested. We identified "Do Not Sell My Info," one of the CCPA taglines, as the best tagline to convey choices related to the sale of personal information. "Privacy Options" and "Privacy Choices" were both effective at conveying privacy controls broadly, and could be paired with either the *toggle* or the *DAA* icon. We also identified sources for misconceptions, namely when the *slash-dollar* icon was presented alone with no further context.

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[17] We initially recruited 1,468 participants, but had to remove 52 responses from our analysis since these responses included nonsensical text to all open-ended questions in the survey.
[18] The codebook used for the opt-out icon + tagline combination study is included in Appendix C-3.

4.2.1 Choices Related to the Sale of Personal Information

Following similar analysis techniques used in the tagline study, we first coded the common themes emerging from participants' responses to "what do you think would happen if you clicked on the symbol/link/symbol and link in the highlighted area on this web page?" Figure 11 shows the distribution of this expectation across study conditions. We then ran regression models[19] to explore which icon and tagline combinations best conveyed the expectation of choices related to "do not sell" or privacy more broadly. The variables "icon" and "tagline" were included as the key independent variables, whereas participants' age, gender, education and technical expertise were included as control variables. We also ran regression models on participant expectations related to the eight scenarios we asked about on the survey that included the same independent variables as before, but with a binary variable as the dependent variable to denote the scenario being *expected* (including "definitely" and "probably") or *unexpected* (including "not sure" "probably not" and "definitely not").

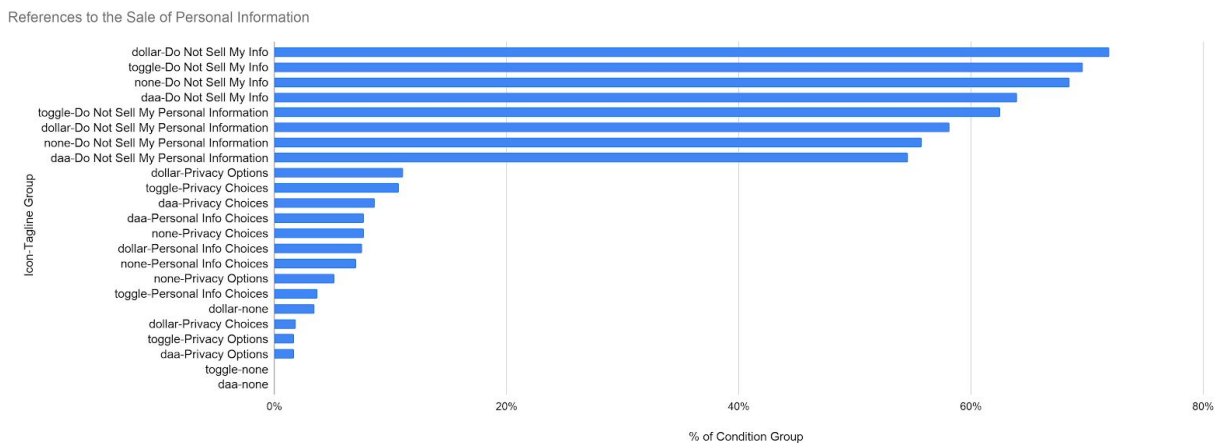References to the Sale of Personal Information

Figure 11: The proportion of participants in each condition who expected the symbol/phrase to lead to a choice about the sale of their personal information, based on open-ended response.

The regression model on participants' open-ended responses suggested that the CCPA taglines "Do Not Sell My Personal Information" and "Do Not Sell My Info" performed the best in terms of leading participants to expect choices related to the sale of personal information.[20] Between the two CCPA taglines, "Do Not Sell My Info" performed slightly better than "Do Not Sell My Personal Information," though their difference became insignificant after applying the

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[19] Since we wanted to compare whether our designed icons and taglines performed better or worse than current requirements in the CCPA, we defined the initial baseline for the icon variable as *no icon*, the baseline for the tagline variable as *Do Not Sell My Personal Information*, and the baseline for the condition variable as *no icon-Do Not Sell My Personal Information*. Throughout the analysis, we switched the baseline for these variables as needed to better understand the differences between other icons, taglines, and combinations that do not involve the control condition.

[20] Using "Do Not Sell My Info" as the baseline, it performed significantly better than "Privacy Choices" (OR = 28.57), "Personal Info Choices" (OR = 32.41), "Privacy Options" (OR = 46.54), and no tagline (OR = 195.30), $p < 0.001$ for all comparisons.

Holm-Bonferroni correction. However, the icon participants saw did not seem to have an impact on their expectation of a "do not sell" choice. Looking at the icon-tagline combinations, the *dollar-Do Not Sell My Info* condition was best; 72% of participants assigned to this condition formed the expectation of "do not sell" choices, which was significantly better than 13 out of the other 22 conditions (OR ranging from 20.10 to 162.80, p<0.001 for all), though the difference between this and the control condition (*no icon-Do Not Sell My Personal Information*) was not significant.

Participants' likert-scale responses to the "do not sell" choices scenario further corroborate findings above. As can be seen from Figure 12, the top three conditions with the most "definitely" and "probably" responses all included the CCPA taglines. However, the likert-scale responses suggest that the *none-Do Not Sell My Info* condition was the best to convey "do not sell choices," with significant differences captured between it and 11 out of the other 22 conditions.[21] The *dollar-Do Not Sell My Info* condition, which performed best in the regression model with participants' open-ended responses, only ranked sixth in Figure 12, suggesting that the choice of icon has only a marginal impact on user expectations.
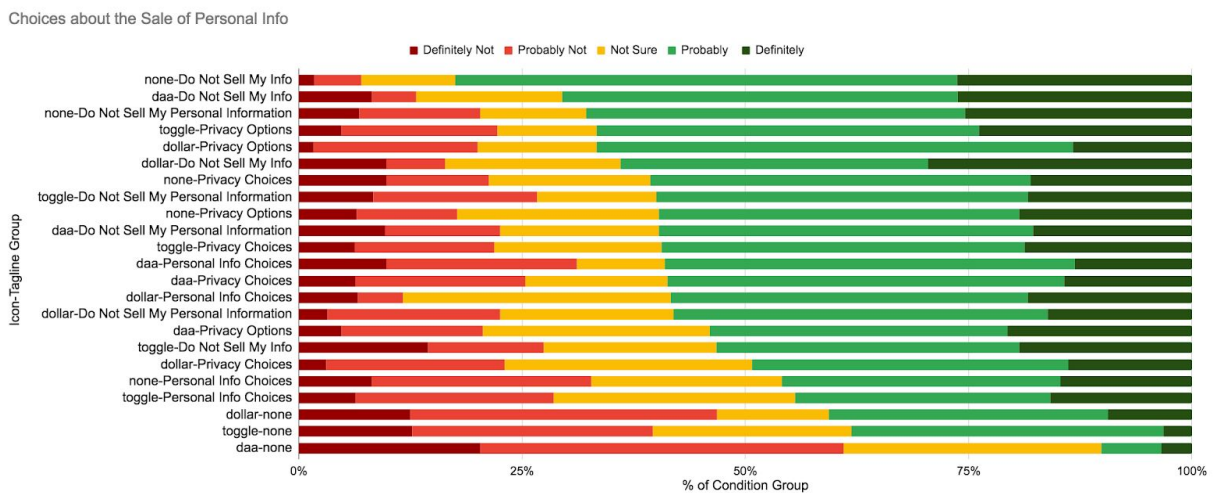

Figure 12: Distribution of participants' responses across study conditions to the scenario "It [the symbol/phrase] will take me to a page with choices about the sale of my personal information."

4.2.2 Choices Related to How Personal Information is Used (Privacy Choices)

We also examined which icon and tagline combination led to the expectation of privacy choices more broadly. Figure 13 shows the distribution of this expectation across study conditions. The regression model on participants' open-ended responses shows that the tagline that best

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[21] For the comparison between *none-Do Not Sell My Info* and other conditions: OR ranging from 2.92 to 48.85, p = 0.006 for *toggle-Do Not Sell My Info*, p = 0.004 for *DAA-Privacy Options*, p = 0.04 for *DAA-Personal Info Choices*, p = 0.02 for *dollar-Personal Info Choices,* p = 0.006 for *dollar-Privacy Choices,* and p < 0.001 for others that had significant differences.

created this expectation was "Privacy Options," followed closely by "Privacy Choices."[22] Though the differences between these taglines were not significant, a slightly larger percentage of those who saw the "Privacy Options" tagline had the expectation to see a privacy choice after clicking the symbol/phrase compared to those who saw "Privacy Choices." The tagline "Do Not Sell My Personal Information" performed better than no tagline (OR = 2.12, p = 0.005), but significantly worse than "Privacy Options" (OR = 0.05, p < 0.001), "Privacy Choices" (OR = 0.06, p < 0.001), and "Personal Info Choices" (OR = 0.37, p < 0.001). In terms of icons, the *toggle* icon or *DAA* icon led to the expectation of privacy choices more frequently than *no icon*, though the differences were not significant in the regression models. Additionally, the presence of the *slash-dollar* icon significantly decreased the odds of expecting privacy choices compared to no icon (OR = 0.60, p = 0.03). Looking at the icon-tagline combinations, the *toggle-Privacy Options* condition had the highest odds of leading participants toward expecting privacy choices, with significant differences captured between it and 14 out of the other 22 conditions (OR ranging from 8.45 to 201.50, p < 0.001 for all). This suggests that the *toggle* icon alone would not be sufficient enough to convey privacy choices, and must be accompanied by corresponding taglines that had the keyword "privacy" in it.
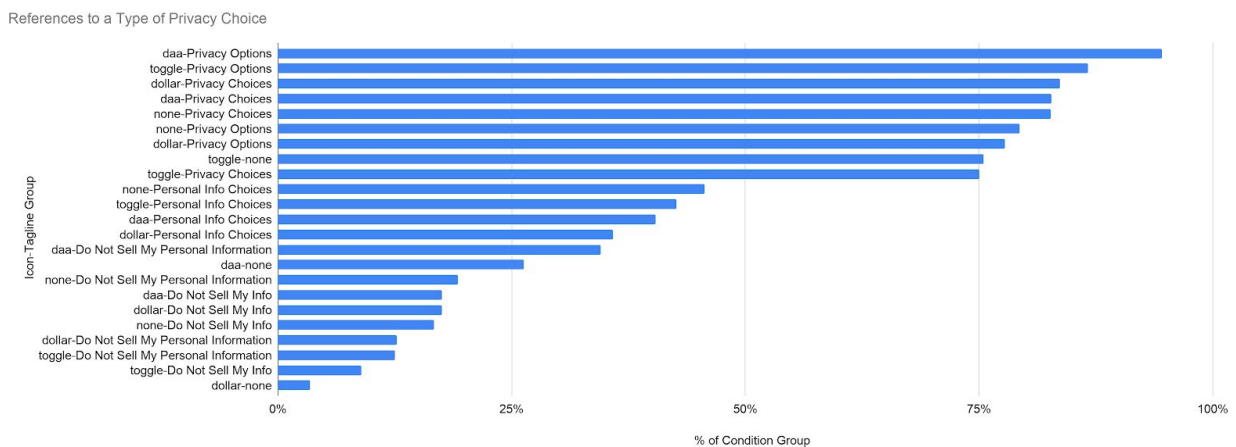

Figure 13: The proportion of participants in each condition who expected the symbol/phrase to lead to a type of privacy choice, based on open-ended responses.

Participants' likert-scale responses to the privacy choices scenario (see Figure 14) further confirm that **toggle-Privacy Options was the best candidate for conveying choices about how personal information is used or shared,** followed closely by *DAA-Privacy Choices*, *no icon-Privacy Options*, and *DAA-Privacy Options*. The *toggle-Privacy Options* condition was significantly better than 8 out of the other 22 conditions[23] (OR ranging from 5.05 to 35.94,

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[22] Using "Privacy Options" as the baseline, it performed significantly better than "Do Not Sell My Info" (OR = 28.38), "Do Not Sell My Personal Information" (OR = 21.08), "Personal Info Choices" (OR = 7.70) and no tagline (OR = 9.95), p < 0.001 for all comparisons.

[23] For the comparison between *toggle-Privacy Options* and other conditions: OR ranging from 5.05 to 35.94, p = 0.013 for *dollar-Do Not Sell My Personal Information,* p = 0.02 for *toggle icon only*, p = 0.004 for *toggle-Do Not Sell My Personal Information*, p = 0.02 for *toggle-Personal Info Choices*, p = 0.02 for

p-value ranging from p < 0.001 to p < 0.01), but the differences between it and other conditions on the top tier were rather minimal, suggesting some flexibility of using other icons or no icon with the "Privacy Options" tagline.
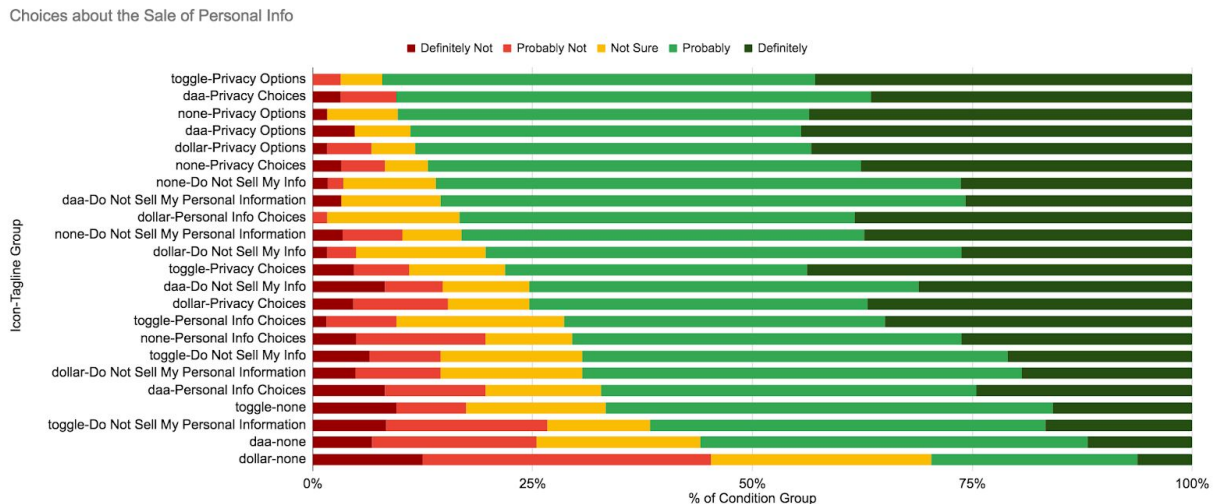

Figure 14: Distribution of participants' responses across study conditions to the scenario "It [the symbol/phrase] will take me to a page with choices about how my personal information is used and shared by the website.

4.2.3 Misconceptions with "Personal Info Choices"

For participants who were assigned to conditions that included a tagline, we elicited their comprehension of certain elements in the tagline by asking "What do you think [tagline element] refers to in this link?" Overall, participants exhibited good comprehension of most tagline elements. The majority of participants correctly associated "sell" with the sale of personal information (83.1%), "information/info" with personal information or more specific types such as names, addresses, and purchasing/browsing history, and "options" with controls related to the collection, processing, and sharing of their personal data or broader privacy options (71.5%). The word "choices" appeared to be more ambiguous, with only 55.9% of participants interpreting it as controls related to the collection, processing, and sharing of their personal data or broader privacy choices. The remaining participants related "choices" to choices about shoe styles or sizes available on the website (13.8%), different settings in their user profile related to the purchasing of shoes (4.4%), or choices related to payment methods (2.4%).

A Pearson's chi-squared test found that there were significant differences between conditions in how "choices" was interpreted (p < 0.001, Cramer's V = 0.27). Post-hoc pairwise comparisons, with Holm-Bonferroni corrections, further showed that the *toggle-Privacy Choices* condition was better in conveying the intended meaning of "choices" than all conditions with the "Personal Info Choices" tagline. This suggests that **"Personal Info Choices" is less ideal than other**

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toggle-Do Not Sell My Info, p = 0.01 for *daa-Personal Info Choices*, p = 0.02 for *none-Personal Info Choices*, and p < 0.001 for others that had significant differences.

taglines to convey choices related to "do not sell" or privacy, at least in the context of a shoe website.

4.2.4 Misconceptions with Candidate Icons

Similar to the tagline study, we binned participants' responses regarding their expectations related to the icon/tagline combination they saw into two categories, correct and incorrect, where incorrect means the responses exhibited misconceptions. Out of 1,1416 participants, 42 participants (3.0%) reported the expectation of being offered different payment options, particularly those related to secure or encrypted payment. The majority of these participants (26) were assigned to conditions with *slash-dollar* icon, indicating that this icon, even when paired with taglines, might be too suggestive of payment, transaction, or other money-related concepts that do not match the sale of personal information accurately.

Furthermore, 14 participants (1.0%) reported the expectation that by interacting with the icon and/or tagline, they were actually giving the website the permission to sell their personal information. Among them, six noted that they viewed the *toggle* icon as a type of privacy control (i.e., by clicking it, the check mark area would turn blue and the x would turn white, indicating that the user has consented to the sale of their data). Though this misconception was rare (6 of 1,416 responses in total), it is worth noting that **the *toggle* icon has a slight possibility of being viewed as an actual control (rather than a static icon) to give websites permission to sell data, which could deter users from interacting with it**.

We further ran regressions to quantitatively examine how different icons, taglines and the combinations of both were associated with misconceptions. Confirming the descriptive statistics, the tagline "Personal Info Choices" had the highest odds of generating misconceptions compared to all other tagline conditions, except *no tagline* (OR ranging from 3.71 to 7.88, $p < 0.001$ for all). The *slash-dollar* icon has the highest odds of generating misconceptions compared to all other icon conditions, including *no icon* (OR ranging from 2.18 to 3.06, $p = 0.003$ for *no icon*, and $p < 0.001$ for the *toggle* icon and the *DAA* icon). Looking at the combinations of icons and taglines, the worst condition was not *dollar-Personal Info Choices* however, but rather *dollar icon only*, which was significantly worse than all other conditions (OR ranging from 5.04 to 134.10, $p < 0.001$ for all), suggesting that **participants struggled to interpret the slash-dollar icon when it was presented alone. However, a text tagline could partially mitigate potential misconceptions**. Participants who saw the *slash-dollar* icon paired with the taglines that were related to selling (i.e.,"Do Not Sell My Personal Information" or "Do Not Sell My Info") did not have a significantly different likelihood of having a misconception relative to those who saw other icon and tagline combinations.

4.3 Icon + Tagline Combination Recommendations

To convey the presence of a "do not sell" opt-out, CCPA taglines "Do Not Sell My Personal Information" and "Do Not Sell My Info" should be used. Our findings indicate that the CCPA taglines were most effective in conveying the expectation of choices related to the

sale of personal information, but that the icon these taglines were paired with made only a marginal difference. It is important to consider that a shorter tagline may work better across different websites and environments, such as mobile apps and browsers. In our previous testing of further abbreviations of the CCPA taglines, we found that "Don't Sell My Info" had similar performance as the two taglines currently in the regulations in creating an expectation of "do not sell" choices. However, further shortening the tagline to "Do Not Sell" and "Don't Sell" was problematic, as without a reference to "my info," these taglines did not lead participants to think about the sale of their personal information.

To convey the presence of privacy choices, the toggle icon paired with the text tagline "Privacy Options" should be used. Our analysis suggests that the *toggle* icon paired with "Privacy Options" was best out of the icon and text tagline combinations we examined in conveying the presence of a privacy choice. Replacing "Privacy Options" with "Privacy Choices" was a close second. Our testing revealed that the tagline "Personal Info Choices" led to misconceptions, with participants relating the phrase to choices related to personalization and purchasing, or information about products sold on the website. The *slash-dollar* icon also created misconceptions, with participants associating the icon with payment or other money-related concepts. While the *toggle* icon did give some participants the impression that it was an actual toggle control related to whether websites could sell their information, this misconception was relatively rare.

The existing Privacy Rights icon and AdChoices icon suggest a place for more information, but not privacy choices. We tested both the green Privacy Rights icon that the Digital Advertising Alliance recommends for CCPA compliance and the blue AdChoices icon that has been used to signal behavioral advertising privacy choices since 2011. Neither were widely recognized by our participants. The lowercase "i" in these icons conveyed the concept of "more information" and the triangle shape conveyed the concept of an audio or video "play" button, but the icon failed to communicate the ability to make choices or opt-out.

Regulations should be supplemented with public education. While our study did not look at whether people would notice the icon during the course of their normal activities, it is likely that many people will not notice it even if commonly implemented on websites. Furthermore, our testing found evidence that widespread implementation of an icon is not enough. Though an intuitive icon and tagline combination would have a great impact on communicating the presence of a "do not sell" or other privacy choices, an information campaign will be critical to educate the public once the icon and text tagline are finalized in regulation.

The best icon to pair with current CCPA taglines to convey a "do not sell" opt-out is a *toggle* icon. This combination effectively communicates the presence of a choice, particularly one related to the sale of personal information.

 Do Not Sell My Personal Information

The best choice overall to convey the broader concept of privacy controls is the "Privacy Options" tagline accompanied by the *toggle* icon. This combination effectively conveys privacy choices and settings. It could become a standardized means for accessing privacy-related choices, including CCPA opt-out of the sale of personal information, supporting consumers' ability to locate these choices in a consistent location without the need for a proliferation of privacy-related links and icons.

 Privacy Options

5. Additional Usability Considerations

The user studies we conducted solely focused on identifying an opt-out icon and tagline that was interpretable by users as a privacy action related to how a website can use their personal information. However, for choices, such as an opt-out from the sale of personal information, to be truly usable there are other components of the interaction required to exercise these choices that must also be considered. Furthermore, privacy choices must be tested to ensure that they are available to all types of users, from those using mobile devices to those with specific accessibility needs.

5.1 Usability of the End-to-End Interaction

Privacy choices must be easy to find. In order for users to exercise privacy choices on a website, they must first be able to find where they are located. Regulation, such as the CCPA, can play a major role in improving the discoverability of these types of controls. Beyond specifying the format of a mandated choice, regulations should further standardize where the choice must be placed on a website or other communications by a company. As a positive example, unsubscribe links embedded within emails, required to be offered in commercial emails by the CAN-SPAM Act, have been found to be more usable relative to other forms of privacy choices [8]. Standardizing placement of the opt-out allows users to form a consistent expectation about where to find them that carries across different types of companies and services with which they interact [22].

Privacy choices must be easy to use. Another important consideration in the usability of privacy choices are the actions actually required to use them. In the case of the CCPA's opt-out to the sale of personal information, the most user-centric approach in which the opt-out could be implemented would be if the opt-out was directly applied once the user clicked the opt-out icon/button. However, on some websites this interaction is not possible as additional user input is required (e.g., name, account id, etc.). As such, companies are likely to link the opt-out button/logo to a web form. To minimize the effort required on the part of the user, companies must not require that users complete more form fields than is necessary to complete the

request. When implementing such webforms, companies must also be sure to follow conventional design practices so that users can complete the form as efficiently as possible. Such practices include:

- Provide a clear global "opt out" option at the top of the form if more granular options are present [20]
- Use positive and active wording for labels so it is clear what happens when a user selects an option or completes an action [19]
- Vertically lay out lists (such as those for different categories of personal information) [19].
- Have a clear, selected state for options available to users [3]
- A confirmation step may be unnecessary but a "resubscribe" or other recourse action should be provided on the page in case of mistakes [32].

Below are examples of webforms following these guidelines that websites can use to provide California consumers their right to opt out of the sale of personal information. Though these forms follow the described design best practices, additional user testing with these forms is required to ensure that they are truly usable.

Webform that only requires the users' email address, and an indication of whether the request is for themselves or another individual. This form could be used in cases in which a website needs to only provide a "global" opt-out function, rather than granular options corresponding to different types of data

Webform in which "granular" options are offered related to different categories of personal information. This form also includes a link to more information about these categories, for consumers who wish to learn more.

Users must be able to understand the outcome of using a privacy choice. A final important usability consideration in the interaction required to exercise privacy choices is ensuring that users understand the outcomes of their actions. Prior to submitting a final action, such as submitting a webform or saving an account setting, users must be provided with a brief but precise explanation of the specific privacy choice. Users are unlikely to read paragraphs of text, or "legalese" typically found in privacy policies. In order to provide an appropriate explanation, the company must consider what users likely already know and eliminate excessive text accordingly. As such, websites must perform their own usability testing to ensure that their particular webform design is easy to use and any text descriptions of privacy choices are easy to understand and not misleading. Alternatively, a standardized and user-tested web form template could be provided by the regulator, and/or its use could be required by regulation.

5.2 Ensuring Choices are Available to All

Privacy choices must be available to mobile users. In 2016, mobile browsing exceeded browsing on a desktop environment for the first time [31], highlighting the importance for privacy choices to be available on desktop versions of websites to also be available and usable in

mobile environments. Smaller screens will have an impact on how well graphical elements of privacy choices, such as the CCPA opt-out logo/button, are interpreted. While this was a consideration during the design process for our proposed icons, it still remains to be tested whether the interpretation of our final recommendations would change in a mobile environment. However, this testing would be necessary if these icons were to be widely used.

Privacy choices must be accessible to all. Another important consideration is whether any step of the interaction required to use a privacy choice poses accessibility barriers. Implementations of controls, such as an opt-out mechanism for the sale of personal information, should be compatible with tools used by those with accessibility needs, such as screen readers and keyboard shortcuts, in order for these populations to be able to effectively exercise privacy choices without assistance. Additionally, the use of color in the interaction should only be to enhance user understanding of a feature, and not to convey a specific state [2]. In our testing we explored both grayscale and colored versions of our candidate icons, and found that adding color to the icons largely did not impact participants' interpretations. Though CCPA regulations state that required notices be accessible to consumers with disabilities (e.g., section 999.305(d)), it currently does not have the same requirements for the interaction to use mandated choices, such as the "do not sell" opt-out, which could impact a particularly vulnerable population of consumers.

About the Study Team

Bibliography

1. A. Acquisti, M. Sleeper, Y. Wang, S. Wilson, I. Adjerid, R. Balebako, L. Brandimarte, L. F. Cranor, S. Komanduri, P. G. Leon, N. Sadeh, and F. Schaub, "Nudges for Privacy and Security", *ACM Computing Surveys (CSUR)*, 50, 3, 2017.

2. N. Babich. Best Practices for Mobile Form Design, Smashing Magazine, 2018.

3. Balsamiq. Accordions, 2019.

4. Center for Internet and Society at Stanford Law School. Privicons.

5. Disconnect, Inc. GitHub - disconnectme/privacy-icons, 2014.

6. J. Gomex, T. Pinnick, and A. Soltani. "Know Privacy Report", Technical report, Know-Privacy, 2009.

7. C. Graf, C. Hochleitner, P. Wolkerstorfer, J. Angulo, S. Fischer-Hübner, and E. Wästlund. "Final HCI Research Report", Technical report, Privacy and Identity Management in Europe for Life, 2011.

8. H. Habib, S. Pearman, J. Wang, Y. Zou, A. Acquisti, L.F. Cranor, N. Sadeh, and F. Schaub, "'It's a scavenger hunt': Usability of Websites' Opt-Out and Data Deletion Choices", *Conference on Computer Human Interaction (CHI),* 2020.

9. H. Habib, Y. Zou, A. Jannu, N. Sridhar, C. Swoopes, A. Acquisti, L.F. Cranor, N. Sadeh, and F. Schaub, "An Empirical Analysis of Data Deletion and Opt-Out Choices on 150 Websites", *Symposium on Usable Privacy and Security (SOUPS)*, 2019.

10. Helsinki Institute for Information Technology. GitHub - HIIT/mydata-sdk, 2016.

11. R. Iannella and A. Finden. "Privacy Awareness: Icons and Expression for Social Networks", *Virtual Goods Workshop and the 6th ODRL Workshop*, 2010.

12. S. Karanam, J. Viswanathan, A. Theertha, B. Indurkhya, and H. Van Oostendorp. "Impact of Placing Icons Next to Hyperlinks on Information-Retrieval Tasks on the Web", *Annual Meeting of the Cognitive Science Society,* 32, 32, 2010.

13. V. B. Kumar, R. Iyengar, N. Nisal, Y. Feng, H. Habib, P. Story, S. Cherivirala, M. Hagan, L.F. Cranor, S. Wilson, F. Schaub, N. Sadeh, "Finding a Choice in a Haystack: Automatic Extraction of Opt-Out Statements from Privacy Policy Text", *The Web Conference (the Web Conf)*, 2020.

14. J. Lazar, J.H. Feng, and H. Hochheiser. *Research Methods in Human-Computer Interaction*. Morgan Kaufmann, 2017.

15. P.G. Leon, J. Cranshaw, L.F. Cranor, J. Graves, M. Hastak, and B. Ur. "What Do Online Behavioral Advertising Disclosures Communicate to Users?", *Technical Report CMU-CyLab-12-008*, 2012.

16. P.G. Leon, B. Ur, R. Balebako, L.F. Cranor, R. Shay, and Y. Wang. "Why Johnny Can't Opt Out: A Usability Evaluation of Tools to Limit Online Behavioral Advertising", *Conference on Computer Human Interaction (CHI),* 2012.

17. M. Mehldau. Icon set for privacy statements, 2007.

18. Nielsen Norman Group. Affinity Diagramming for Collaboratively Sorting UX Findings and Design Ideas, 2018.

19. Nielsen Norman Group. Checkboxes vs. Radio Buttons, 2004.

20. Nielsen Norman Group. Top 10 Design Mistakes in the Unsubscribe Experience, 2018.

21. The Noun Project. Free Icons for Everything. 2019.

22. D. Norman. *The Design of Everyday Things: Revised and Expanded Edition*. Basic books, 2013.

23. A. Rao, F. Schaub, N. Sadeh, A. Acquisti, R. Kang, "Expecting the Unexpected: Understanding Mismatched Privacy Expectations Online", *Symposium on Usable Privacy and Security (SOUPS)*, 2016.

24. A. Raskin. Privacy Icons: Alpha Release, 2010.

25. J. R. Reidenberg, N.C. Russell, V. Herta, W. Sierra-Rocafort, and T. Norton, "Trustworthy Privacy Indicators: Grades, Labels, Certifications and Dashboards", *Washington University Law Review*, 96, 6, 2019.

26. J.R. Reidenberg, J. Bhatia, T.D. Breaux, T.B. Norton, "Automated Comparisons of Ambiguity in Privacy Policies and the Impact of Regulation", *Journal of Legal Studies*, 45, 2, part 2, 2016.

27. A. Rossi and M. Palmirani. DaPIS: a Data Protection Icon Set to Improve Information Transparency under the GDPR, Technical report, GDPR by Legal Design, 2019.

28. F. Schaub, R. Balebako, and L.F. Cranor, "Designing Effective Privacy Notices and Controls", *IEEE Internet Computing*, 21, 3, 2017.

29. F. Schaub, R. Balebako, A. Durity, L.F. Cranor, "A Design Space for Effective Privacy Notices", *Symposium on Usable Privacy and Security (SOUPS)*, 2015.

30. Stanford Legal Design Lab. Icons for legal help.

31. StatCounter Global Stats. Mobile and tablet internet usage exceeds desktop for first time worldwide, 2016.

32. UX Alpaca. Double confirmation: to be or not to be?, 2017.

Appendix A: List of Existing Privacy Iconography in Background Research

1. Center for Internet and Society at Stanford Law School. Privicons, https://cyberlaw.stanford.edu/our-work/projects/privicons.

2. Disconnect, Inc. GitHub - disconnectme/privacy-icons, 2014. https://github.com/disconnectme/privacy-icons.

3. J. Gomex, T. Pinnick, and A. Soltani. "Know Privacy Report." Technical report, Know-Privacy, 2009.

4. C. Graf, C. Hochleitner, P. Wolkerstorfer, J. Angulo, S. Fischer-Hübner, and E. Wästlund. "Final HCI Research Report". Technical report, Privacy and Identity Management in Europe for Life, 2011.

5. Helsinki Institute for Information Technology. GitHub - HIIT/mydata-sdk, 2016. https://github.com/HIIT/mydata-sdk/tree/master/graphics.

6. R. Iannella and A. Finden. "Privacy Awareness: Icons and Expression for Social Networks". *Virtual Goods Workshop and the 6th ODRL Workshop*, 2010.

7. M. Mehldau. Icon set for privacy statements, 2007. https://netzpolitik.org/2007/iconset-fuerdatenschutzerklaerungen/#.

8. A. Raskin. Privacy Icons: Alpha Release. http://www.azarask.in/blog/post/privacy-icons/.

9. A. Rossi and M. Palmirani. DaPIS: a Data Protection Icon Set to Improve Information Transparency under the GDPR. Technical report, GDPR by Legal Design, 2019..

10. Stanford Legal Design Lab. Icons for legal help. https://betterinternet.law.stanford.edu/icons-for-legal-help/.

11. The Noun Project. Free Icons for Everything. https://thenounproject.com/.

Appendix B: Survey Questions

Appendix B-1: Survey Questions for the Opt-Out Icon Study

Icon Evaluation

Please answer the following questions with regards to the displayed symbol.

[Display the symbol or symbol + "Do Not Sell My Personal Information" that participants were randomly assigned to]

1.1. What, if anything, does this symbol communicate to you? Please be as complete as possible. *[Open-ended response, displayed only if this is an icon-only condition.]*

1.2. What, if anything, does this symbol and phrase communicate to you? Please be as complete as possible. *[Open-ended response, displayed only if this is an icon-tagline condition.]*

2.1. Imagine if you saw this symbol on a website. What do you think would happen if you clicked on this symbol? *[Open-ended response, displayed only if this is an icon-only condition.]*

2.2. Imagine if you saw this symbol on a website. What do you think would happen if you clicked on this symbol or this phrase? *[Open-ended response, displayed only if this is an icon-tagline condition.]*

Prior Experience
Please answer the following questions with regards to the displayed symbol.

[Display the AdChoices icon rendered in blue]

3. Have you ever seen this symbol on a website before?
   - Yes
   - No
   - I am not sure

4. Imagine if you saw this symbol on a website. What do you think would happen if you clicked on this symbol? *[Open-ended response]*

Do Not Sell Choices

5. Which of these symbols do you think best conveys that **there's an option to tell websites "do not sell my personal information"**?

[Icons for round 1 test, presented in randomized order:]
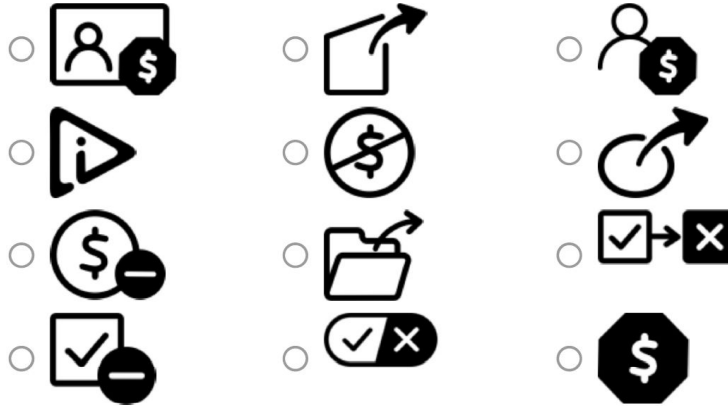
[Icons for round 2 test, presented in randomized order:]
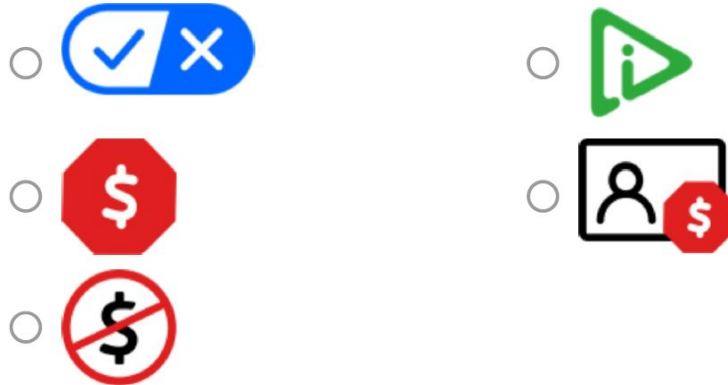
6. Please explain why you selected the icon above. *[Open-ended response]*

Personal Info Choices

7. Which of these symbols do you think best conveys that **there's an option to make choices about the use of your personal information**?

[Shown the same icon set as in Q5]

8. Please explain why you selected the icon above. *[Open-ended response]*

Demographics and Background

9. Are you aware of any laws in the United States that require companies to provide a "do not sell my personal information" option?
- No
- Yes (please name or describe them): ___

10. What is your age?
- 18-24

- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85 or older
- Prefer not to answer

11. What is your gender?
- Female
- Male
- Non-binary
- Prefer to self-describe: ___
- Prefer not to answer

12. What is the highest level of education you have completed?
- Less than high school
- High school degree or equivalent
- Some college, no degree
- Associate's degree, occupational
- Associate's degree, academic
- Bachelor's degree
- Master's degree
- Professional degree
- Doctoral degree
- Prefer not to answer

13. What was your total household income before taxes during the past 12 months?
- Under $15,000
- $15,000 to $24,999
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $149,999
- $150,000 or above
- Prefer not to answer

14. In which state do you currently reside? *[Open-ended response]*

15. Which of the following best describes your educational background or job field?
- I have an education in, or work in, the field of computer science, computer engineering or IT.

- I do not have an education in, or work in, the field of computer science, computer engineering or IT.
- Prefer not to answer

16. If you have any feedback on the survey, please leave it here. *[Open-ended response]*

Appendix B-2: Survey Questions for the Opt-Out Link Text/Tagline Study

Link Evaluation
Please answer the following questions with regards to the web link. Make sure not to reveal any private or personally identifiable information about yourself or others in your responses to any open-ended questions.

Imagine if you saw this link on a website.

[Display the link text/tagline that participants were randomly assigned to]

1.1. What type of selling do you think this link refers to? *[Open-ended response, displayed only if the tagline text includes "sell."]*

1.2. What type of personal information do you think this link refers to? *[Open-ended response, displayed only if the tagline text includes "information" or "info."]*

1.3. What type of choices do you think this link refers to? *[Open-ended response, displayed only if the tagline text includes "choices."]*

1.4. What type of options do you think this link refers to? *[Open-ended response, displayed only if the tagline text includes "options."]*

1.5. What type of opt-outs do you think this link refers to? *[Open-ended response, displayed only if the tagline text includes "opt-outs."]*

2. What do you think would happen if you clicked this link? *[Open-ended response, displayed to all participants.]*

Tagline Expectations
Imagine if you saw this link on a website.

[Display the same link text/tagline participants were randomly assigned to]

3. Which of the following do you think could happen if you clicked this link on a web page? *[For each statement below, participants were asked to choose from a 5-point likert scale "Definitely" "Probably" "Not sure" "Probably not" and "Definitely not." Statements were presented in randomized order.]*

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- It will take you to the website's Terms of Service statement.
- It will take you to a page that verifies that the website does not sell your personal information.
- It will take you to a page where you can pay to protect your personal information.
- It will take you to a page with choices about the sale of your personal information.
- It will immediately communicate to the website that you do not want your personal information to be sold.
- It will take you to a page with choices about how your personal information is used and shared by the website.
- It will give the website permission to sell your personal information.
- It will take you to a warning not to share your personal information with websites.

Demographics and Background

4. Are you aware of any laws in the United States that require companies to provide a "do not sell my personal information" option?
- No
- Yes (please name or describe them): ___

5. What is your age?
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85 or older
- Prefer not to answer

6. What is your gender?
- Female
- Male
- Non-binary
- Prefer to self-describe: ___
- Prefer not to answer

7. What is the highest level of education you have completed?
- Less than high school
- High school degree or equivalent
- Some college, no degree
- Associate's degree, occupational
- Associate's degree, academic
- Bachelor's degree

- Master's degree
- Professional degree
- Doctoral degree
- Prefer not to answer

8. What was your total household income before taxes during the past 12 months?
- Under $15,000
- $15,000 to $24,999
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $149,999
- $150,000 or above
- Prefer not to answer

9. In which state do you currently reside? *[Open-ended response]*

10. Which of the following best describes your educational background or job field?
- I have an education in, or work in, the field of computer science, computer engineering or IT.
- I do not have an education in, or work in, the field of computer science, computer engineering or IT.
- Prefer not to answer

11. Which of the following best describes your primary occupation?
- Administrative Support (e.g., secretary, assistant)
- Art, Writing, or Journalism (e.g., author, reporter, sculptor)
- Business, Management, or Financial (e.g., manager, accountant, banker)
- Education or Science (e.g., teacher, professor, scientist)
- Legal (e.g., lawyer, paralegal)
- Medical (e.g., doctor, nurse, dentist)
- Computer Engineering or IT Professional (e.g., programmer, IT consultant)
- Engineer in other field (e.g., civil or bio engineer)
- Service (e.g., retail clark, server)
- Skilled Labor (e.g., electrician, plumber, carpenter)
- Unemployed
- Retired
- College student
- Graduate student
- Mechanical Turk worker
- Other: ___
- Prefer not to answer

12. If you have any feedback on the survey, please leave it here. *[Open-ended response]*

Appendix B-3: Survey Questions for the Opt-Out Icon + Tagline Combination Study

Open-ended Expectations

Please answer the following questions with regards to the symbol and the link in the rectangular highlighted area near the bottom of the web page displayed. Make sure not to reveal any private or personally identifiable information about yourself or others in your responses to any open-ended questions.

[Display the screenshot of the web page that participants were randomly assigned to]

Close up of highlighted area:

[Display the highlighted area]

1.1. What do you think would happen if you clicked on the symbol in the highlighted area on this web page? *[Open-ended response, displayed only if this is an icon-only condition.]*

1.2. What do you think would happen if you clicked on the link in the highlighted area on this web page? *[Open-ended response, displayed only if this is a tagline-only condition.]*

1.3. What do you think would happen if you clicked on the symbol and link in the highlighted area on this web page? *[Open-ended response, displayed only if this is an icon-tagline condition.]*

Tagline Elements

2.1. What do you think "sell" refers to in this link? *[Open-ended response, displayed only if the participant saw a tagline text that includes "sell."]*

2.2. What do you think "information" or "info" refers to in this link? *[Open-ended response, displayed only if the participant saw a tagline text that includes "information" or "info."]*

2.3. What do you think "choices" refers to in this link? *Open-ended response, displayed only if the participant saw a tagline text that includes "choices."]*

2.4. What do you think "options" refers to in this link? *[Open-ended response, displayed only if the participant saw a tagline text that includes "options."]*

Scenario Expectations

[Display the highlighted area]

3. Which of the following do you think could happen if you clicked this symbol/link on a web page? *[For each statement below, participants were asked to choose from a 5-point likert scale "Definitely" "Probably" "Not sure" "Probably not" and "Definitely not." Statements were presented in randomized order.]*

- It will take me to a page where I can update the information in my user profile on the website.
- It will take me to a page with choices about how my personal information is used and shared by the website.
- It will take me to a page with more information about how the company uses and shares the personal information it collects about me.
- It will cause the website to send unwanted emails.
- It will give the website permission to sell my personal information.
- It will take me to a page with ads about privacy and security products.
- It will take me to a page with choices about how my personal information is used and shared by the website.
- It will take me to a page that steals my information or has a virus or malware.

Demographics and Background

4. Are you aware of any laws in the United States that require companies to provide a "do not sell my personal information" option?
- No
- Yes (please name or describe them): ___

5. What is your age?
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85 or older
- Prefer not to answer

6. What is your gender?
- Female
- Male
- Non-binary
- Prefer to self-describe: ___
- Prefer not to answer

7. What is the highest level of education you have completed?
- Less than high school

- High school degree or equivalent
- Some college, no degree
- Associate's degree, occupational
- Associate's degree, academic
- Bachelor's degree
- Master's degree
- Professional degree
- Doctoral degree
- Prefer not to answer

8. What was your total household income before taxes during the past 12 months?
- Under $15,000
- $15,000 to $24,999
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $149,999
- $150,000 or above
- Prefer not to answer

9. In which state do you currently reside? *[Open-ended response]*

10. Which of the following best describes your educational background or job field?
- I have an education in, or work in, the field of computer science, computer engineering or IT.
- I do not have an education in, or work in, the field of computer science, computer engineering or IT.
- Prefer not to answer

11. Which of the following best describes your primary occupation?
- Administrative Support (e.g., secretary, assistant)
- Art, Writing, or Journalism (e.g., author, reporter, sculptor)
- Business, Management, or Financial (e.g., manager, accountant, banker)
- Education or Science (e.g., teacher, professor, scientist)
- Legal (e.g., lawyer, paralegal)
- Medical (e.g., doctor, nurse, dentist)
- Computer Engineering or IT Professional (e.g., programmer, IT consultant)
- Engineer in other field (e.g., civil or bio engineer)
- Service (e.g., retail clark, server)
- Skilled Labor (e.g., electrician, plumber, carpenter)
- Unemployed
- Retired
- College student

- Graduate student
- Mechanical Turk worker
- Other: ___
- Prefer not to answer

12. If you have any feedback on the survey, please leave it here. *[Open-ended response]*

Appendix C: Codebooks

Appendix C-1: Codebook for the Opt-Out Icon Study

Icon Interpretation (for responses to "What, if anything, does this symbol communicate to you?")

Code	Definition	Example
accept/decline	The icon represents a choice between yes or no/accept or decline.	"It looks like a yes or no choice for a question: Check mark means yes and X means no. The answerer would have to click one or the other."
account balance	The icon shows how much money is left in the account.	"Something to do with money and an account."
activate/deactivate	The icon represents something that can be activated or deactivated.	"Hitting the X will cancel the check."
ad related	The icon is related to AdChoices or choices about ads.	"AdChoices Icon."
cash/dollars not accepted	The icon indicates a restriction of payment in cash.	"It means no cash accepted at this location."
costs money	The icon indicates that something costs money/is not free.	"The $ symbol means that something costs money, that something related to the other icon is charging money for something."
free/no money	The icon suggests something is free and the website would not take money for it.	"I think this item makes me feel like it's completely free, I won't have to pay."
money/paying	The response explicitly mentions the word money or payment without further explanation.	"Money icons."
more information	The icon by clicking it will provide more information.	"The letter i stands for information for me."
move forward	The icon by clicking it shows the next item.	"To me, this symbol indicates moving forward."

no selling allowed	The icon indicates no selling activity is allowed on the website.	"It looks to be a warning against the use of money. Maybe it means you can't sell something on the website."
other	Miscellaneous responses.	N/A
payment method	The icon shows more information or choices about payment methods.	"I think it means they accept credit card payments."
person and money	The icon highlights the concept of person and money.	"It's basically just an icon of a person and the money symbol, so it's 'people money' to me."
play	The icon resembles a play button.	"It reminds me of a play button or maybe a power type button that goes eco friendly when pressed."
price	The icon indicates the price of something.	"It symbolizes the cost of something..or how much something is worth."
sale	The icon indicates a sale is happening.	"It tells me that there is a sale for that specific product."
send money to someone	The icon indicates the need to pay someone money.	"That I have to pay a person wherever this sign is located."
stop spending money	The icon indicates that you should not spend money.	"It communicates both stop and money. Maybe the message is to stop spending money."
true/false	The icon represents a choice between true or false/right or wrong.	"True or false."

Icon-Tagline Interpretation (for responses to "What, if anything, does this symbol and phrase communicate to you?")

Code	Definition	Example
do not sell choice	The icon/tagline represents choices related to the sale of personal information.	"I think it means don't sell my information to anyone. This would probably be email addresses and phone numbers."
garbage	Incomprehensible responses.	N/A
info is provided	The icon/tagline signals more information will be provided.	"It means that information is provided here."

Code	Definition	Example
other	Miscellaneous responses.	N/A
other privacy choices	The icon/tagline indicates different types of privacy choices that are not related to do-not-sell.	"It indicates a privacy choice."
personal info is not sold	The icon/tagline indicates that the website does not sell its users' personal information.	"The text is quite definite, the recording site does not have my permission to sell any info they might collect."
privacy/security	The icon/tagline indicates something about the website's privacy and security.	"I'd see this as the website being consumer-oriented and transparent in their practices/policies in providing this (perhaps) as an option."
should not sell info	The icon/tagline reminds someone to think about the decision to let the website sell their personal information.	"It tells someone not to sell the information they provide a website or company."

Icon Expectation (for responses to "What do you think would happen if you clicked on this symbol?")

Code	Definition	Example
accepted payment methods	The icon shows more information or choices about payment methods.	"It would tell me why they don't accept cash and give me other options to pay."
agree/disagree	The icon shows the user can agree or disagree with something.	"I would agree to some information that I entered or cancel it."
allow/deny	The icon shows the user can allow or deny something.	"It means i am accepting or rejecting to do a specific thing."
cancel payment	The icon indicates an ongoing payment will be canceled.	"I imagine that something involving the stopping of a payment might occur."
enable/disable	The icon shows the user can enable or disable something.	"Turning on or off an option."
exit website	Clicking the icon will close the website/page/program.	"It would either close the program or open it."
garbage	Incomprehensible responses.	N/A

get more info	The icon will lead to more information (without specifying what information is expected).	"A small pop-up window will show up and it gives me brief "information" about what stands next to it."
input/edit your info	The icon will lead to a page where the user can put in more information.	"I would guess that it might be the symbol you click on if you want to sign up and become a member."
make payment	The icon will lead to a page where payments can be made.	"If I were to click this symbol, I imagine I would be taken to a payment page where I had to enter a credit card or paypal information before I could access more of the site."
opens another page	Clicking the icon will open a new tab.	"It would either take me to another page or not depending on whether I selected the "check" or the "X""
other	Miscellaneous responses.	N/A
see balance/status	The icon will lead to account balances.	"To check your balance."
see discounts	The icon will lead to information about discounts, promotions, or coupons.	"I would be given a coupon for a product which I could use during my purchase."
see price info	The icon will display the price associated with something.	"I would imagine it would reveal the amount of money something will cost."
send money	The icon is a gateway to send someone money.	"I would assume that this would be a way to pay someone money."
start content	Clicking the icon will start playing something.	"It would either play something or go on to the next page. It also might give some information."
warning/error	Clicking the icon will trigger a warning or error message.	"I would get some kind of a warning pop up."

Icon-Tagline Expectation (for responses to "What do you think would happen if you clicked on this symbol or this phrase?")

Code	Definition	Example
do not sell applied	Clicking the icon/tagline means the user's personal information will not be sold by the website.	"I would think that clicking the symbol would guarantee that my data is not sold."
do not sell choices	The icon/tagline will lead to opt-out choices regarding the sale of personal information.	"It would lead me to a page where I could request specifically that my info would not be sold to third parties."
do not sell explanatory text	The icon/tagline will lead to more explanation about what "do not sell my personal information" means.	"I would get more information about whatever it is next to, which in this case would be "Do Not Sell My Personal Information."
do not sell verification	The icon/tagline will lead to a statement that the company does not sell users' personal information.	"I would see a little note saying that this company believes in privacy and my personal data will not be sold."
garbage	Incomprehensible responses.	N/A
not sure	The respondent has no idea what the icon/tagline means.	"I don't know."
other privacy choices	The icon/tagline indicates different types of privacy choices that are not related to do-not-sell.	"I would hope it would opt me out of data collection."
protect data	The icon/tagline indicates the website will provide strong protective measures for users' privacy.	"it will protect my personal information."
skepticism	The respondent thinks the icon/tagline's effectiveness is questionable, that nothing or something sketchy would happen.	"I honestly would just assume it does nothing. I would assume it's a marketing gimmick and that the company would just continue to collect/store/analyze/sell every last bit of personal information they could collect, just like most other companies do these days."

| warning | Clicking the icon/tagline will trigger a warning related to sharing personal information, payment etc. | "If I saw it, i would see it as a warning not to spend any money there or that nothing on the site involves money." |

AdChoices Expectation (for responses to "What do you think would happen if you clicked on this symbol [AdChoices icon]?")

Code	Definition	Example
advertising choices	The icon will lead to choices or preferences related to advertisements.	"This would bring up the option to opt out of ads."
garbage	Incomprehensible responses.	N/A
go next	Clicking the icon will bring the user to the next icon or page.	"That I will be sent to the next page."
go to another page/app	The icon will direct the user to another page.	"It would take me to a website that is related to the symbol."
info about audio/video	The icon will give more information about multimedia such as a movie or a song.	"It would give me information on something that is playing (audio/video)."
more info	The icon will lead to more information, without specifying what type of information it is.	"I think it would give me information about something on the website."
not sure	The respondent has no idea what the icon/tagline means.	"I don't know."
other	Miscellaneous responses.	N/A
other ad related	The icon has something to do with ads (but advertising choices were not specified)	"it was about the ad icon."
other privacy choices	The icon indicates different types of privacy choices.	"It will give you privacy options."
play audio/video	The icon is a "play" button.	"It would play an information video."
privacy/security info	The icon will lead to information about privacy or security practices.	"It would probably give me some type of 'information' (i), maybe a privacy policy perhaps."
skepticism	The respondent thinks the icon's effectiveness is questionable, that nothing or something sketchy would happen.	"I have no idea, the symbol means nothing to me and if I saw it I probably would not think to click on it."
warning	Clicking the icon will trigger a warning.	"Probably the site is not secure and my information may be at risk."

Do-Not-Sell Selection (for responses to "Which of these symbols do you think best conveys that there's an option to tell websites "do not sell my personal information"? Please explain why you selected the icon above.")

Code	Definition	Example
allow/yes	Response mentions the tagline conveys the idea of yes or allow.	"There is a yes and no icon."
choice/selection	Response mentions the ability to make choices or selections.	"It shows that there's a choice to make."
exchange/transfer	Response mentions exchange, sharing, or transfer.	"It's the only symbol that explicitly states "no money" so no money transfers would happen."
familiar	Response mentions being familiar with the icon or seeing it before.	"It is the one that was used earlier in the study."
garbage	Response is nonsensical or not useful.	N/A
information	Response mentions information generally, which is more abstract than person/profile.	"it was explaining about the information storage."
money/selling	Response mentions money, sales, or selling.	"This has a money symbol."
none	Response mentions that none really represent privacy choices.	"None of these convey that without more context."
other	Miscellaneous responses.	N/A
person/profile	Response mentions a person or their profile/personal information.	"Because it shows a card with a person signifying personal information."
stop/do not	Response mentions a negation or that an action is stopped or not allowed.	"It has the universal slash which means no."
straightforward	Response mentions that the symbol is straightforward or easy to understand. Typically used if no other aspects of the symbol are mentioned.	"Fairly straight forward icon showing no sell/no money."

Privacy Choice Selection (for responses to "Which of these symbols do you think best conveys that there's an option to make choices about the use of your personal information? Please explain why you selected the icon above.")

Code	Definition	Example
allow	Response mentions allowing something.	"The blue one at least indicates a yes/no possibility, which suggests an opt-out choice."
check/X	Response mentions that a meaning associated with the checkmark, x, or other symbol.	"There is a x and a check mar and they both seem to be separated as if I could make the choice."
choices/selection	Response mentions that the symbol represents that there's a choice or selection but doesn't identify specific features.	"It shows an either/or choice while the others could mean anything. At least it indicates an option."
familiar	Response mentions being familiar with the icon or seeing it before.	"The icon on most sites and probably most times indicate space for more information."
garbage	Response is nonsensical or not useful.	N/A
information	Response mentions information generally, which is more abstract than person/profile.	"I think the "I" in the logo does the best job of implying a decision about Information."
money/selling	Response mentions money, dollar sign, sales, or selling.	"It shows a user avatar and the money symbol to show I have control over the money aspect...."
none	Response mentions that none really represent privacy choices.	"Honestly none of them do so I just chose the first one. I wouldn't assume any of these had anything to do with personal information...."
other	Miscellaneous responses.	N/A
person/profile	Response mentions a person or their profile/personal information.	"There's a picture of a person."
stop/do not	Response mentions a negation, stop, or do not.	"I like the stop sign with a money sign in it as if it is saying stop."
straightforward	Response mentions that the symbol is straightforward or easy to understand. Typically used if no other aspects of the symbol are mentioned.	"It's simple and straightforward. It shows the user exactly what will happen if its clicked."

Appendix C-2: Codebook for the Opt-Out Text/Tagline Study

Interpretation of "Selling" (for responses to "What type of selling do you think this link refers to?")

Code	Definition	Example
financial assets	References to money or things of financial value like stocks	"Selling stocks or investments."
garbage	Response is nonsensical or not useful.	N/A
home buying	References to the purchase of housing properties.	"Selling a home comes to mind where you might decide to rent it out or sell to a company that buys it on the spot like Open Door."
not sure	The respondent has no idea what "selling" means.	"I have no idea."
other	Miscellaneous responses.	N/A
personal info	References to the sale of personal info (generally) or examples of personal info (e.g. email, phone number).	"I would imagine this would refer to selling my info to a third party company affiliated with the website."
physical product	References to the sale of a product/service (e.g. books or shoes).	"Probably a web page about selling personal items."
privacy/security software	References to the selling of security/privacy products that can keep one secure when surfing the internet.	"A service that helps people to hide their personal information online."

Interpretation of "Information" or "Info" (for responses to "What type of personal information do you think this link refers to?"): please refer to Table 2 for codes and examples.

Interpretation of "Choices" (for responses to "What type of choices do you think this link refers to?")

Code	Definition	Example
goods/products	Choices or preferences related to the products and services offered on this website.	"Maybe the choices you are making in a purchase?"
garbage	Response is nonsensical or not useful.	N/A
not sure	The respondent has no idea what "choices" means.	"I don't know."
other	Miscellaneous responses.	N/A
personal info	Choices related to personal information broadly.	"All of those listed above. (Name, phone number, address, age, sex, interests.)"
personal preferences	Choices or preferences related to the person's lifestyle or previous purchases.	"Choices people make regarding shopping, buying, web browsing, behaviors, personal health, etc."
privacy: audience	Choices related to whom information is displayed to on the website (e.g. public vs private profile).	"I think it's referring to which personal information we are choosing to share or reveal on the site to others."
privacy: data controls	Choices related to what data the website can collect or how to use it.	"It could refer to options of how the web site tracks your IP and other identifying information. Or, it might allow you to choose if the site can use cookies during your session."
privacy: data disclosure	Choices related to what the user reveals to the website.	"Some choices could be whether or not the personal information is required or optional."
privacy: do not sell choices	Choices related to the selling or sharing of personal information.	"I will have the choice on whether I want to give consent on letting the company sell my information."
privacy: general	Choices related to privacy/cookie settings broadly.	"I think the above link refers to options regarding user privacy. These options can be selected by the user in order to offer up the best custom experience available."

Interpretation of "Options" (for responses to "What type of options do you think this link refers to?")

Code	Definition	Example
garbage	Response is nonsensical or not useful.	N/A
other	Miscellaneous responses.	N/A
personal info	Options related to personal information broadly.	"Age, gender, educational background, work background, etc."
personal preferences	Options or preferences related to the person's lifestyle or previous purchases.	"Buying preferences, personal preferences."
privacy: audience	Options related to whom information is displayed to on the website (e.g. public vs private profile).	"Settings for your information like who can see it and what access you are giving to the website."
privacy: data controls	Options related to what data the website can collect or how to use it.	"Information on blocking data collection, refusing cookies, clearing caches, using incognito mode, etc."
privacy: data disclosure	Options related to what the user reveals to the website.	"I would think that the only option you have is to give up the information or not."
privacy: general	Options related to privacy/cookie settings broadly.	"List of things you can do to prevent or make it harder for people and companies to get your information."
privacy: do not sell choices	Options related to the selling or sharing of personal information.	"Maybe do not sell my info at all, or do not sell my info without my permission, or a choice of what info I would allow to have sold."
stock options	Options related to which stock to sell and buy.	"Which stocks to sell and which ones you shouldn't."
trading/selling goods	Options related to products or services sold on/by this website.	"Anything that the company and or business is selling."

Interpretation of "Opt-Outs" (for responses to "What type of opt-outs do you think this link refers to?")

Code	Definition	Example
data collection	Opt out from any data collected by the website or a specific type of data collection.	"Would allow you to opt out of collection of personal information."
garbage	Response is nonsensical or not useful.	N/A
marketing	References to email, mail, or ads from a website.	"Opt out of receiving emails or info from the site."
not sure	The respondent has no idea what "opt-out" means.	"I don't know."
other	Miscellaneous responses.	N/A
other privacy opt-outs	Response mentions privacy but not data collection or selling/sharing.	"Opt out of whatever uses of my personal data the websites privacy policy proposes. Could include my email, browsing history, etc."
personal info	Opt-outs related to personal info without specifying the aspect (collection, sharing, selling etc.)	"Certain personal information like age, gender, location, job title, family size, marriage status, etc."
selling/sharing	Opt out from the selling or sharing of the user's information.	"The type of opt-outs that should be available within this link should be about personal information and how it is shared with other companies and affiliates."

Tagline Expectation (for responses to "What do you think would happen if you clicked on this this link?")

Code	Definition	Example
account settings	Generic account settings, excluding mentioning of privacy settings. Also includes things specific to the shoe website for the combo test	"It would bring you to personal account options"
ask for more info	The link leads to a survey/ questionnaire/form for consumers to fill out. Note, the sentiment here is neutral. The participant simply says they are expecting to enter more information. If they express the feeling "more data about them will be collected" it should be coded as violation: do not sell	"It would take you to a site to fill out a questionnaire."
choices: data deletion	Remove information collected by the website, or remove information from a mailing list	"I would be taken to a website that has all my personal information and I would probably have the option to delete it from the site."
choices: do not sell	Specific mentioning that consumers will have the option to choose whether or what types of data can or cannot be sold to third-parties	"It would give you the option to not have your personal information given, shared, or sold to someone else."
choices: generic	The mentioning that they expect to see more choices, but do not specify what kind of choice it is	"It would take you to some choices to look at what you prefer."
choices: opt-out	Either generic opt out of "something"or opt out of things other than do not sell, such as data collection	"I would probably go to one of those forms that lists all the information-gathering the site makes, and which ones I can opt out of."
choices: privacy	Choices that typically fall under the category of privacy choices, but are not exactly about selling or sharing information to third-party companies	"i would probably go to a page that allows me to opt out of certain information being stored on the site"

confirmation: do not sell	The link will lead to a page that double checks whether or not the participant wants their information not to be sold to others	"You would be taken to a page to confirm you wish your personal information not to be shared."
enforced: do not sell	The user assumes that the do not sell request will definitely be honored by the company	"My data will not be sold"
expected: privacy protection	The user will enjoy a higher level of privacy protection that does not relate to do not sell, e.g., no tracking applied	"it could provide privacy for me"
garbage	Incomprehensible gibberish	"good"
give selling permission	expectation that the "do not sell" request will not be honored, or even more seriously, more data will actually be collected or sold (differing from phishing/spamming it is a specific scenario)	"It would take you to a page that says you can't add anything to sell"
investment advice	The link leads to advice on investment, which stocks should be sold and which not, etc.	"I would get a list of stocks they recommended not selling"
more info: data practices	More info on how the site collects, uses, and shares user data, a more granular description of privacy policy	"A page where you understand how your info will be used"
more info: do not sell	More info on how to make use of the "do not sell" choice or how the company does not sell consumer information to third parties	"It would tell me how to choose not to share my information."
more info: generic	The general feeling that they would see more information	"it would take me to a page with more info"
more info: privacy protection	The link will lead to more information talking about how one can protect their own privacy or make use of this site's privacy settings	"There would be information regarding identity theft and how to protect yourself from becoming a victim."
new page	The link will direct the user to a new page/site, open a new tab/window, without giving any further context of what's included in the page.	"It opens a web page."

nothing	The respondent thinks nothing would happen by clicking the link.	"Realistically - nothing. I don't think that I'd necessarily trust a company that had such a link to actually honor my selection to not sell my data."
not sure	The respondent has no idea what the tagline means.	"I don't know."
other	Miscellaneous responses.	N/A
request: do not sell	The user expects to be taken to a page where they can require the company to not sell their personal data, but they do not explicitly say they expect the request to be honored (hence different from enforced: do not sell)	"I will be shown a page that allows me to opt out of allowing companies to sell my private information, similar to opting out of junk mail."
phishing/malware	Getting phishing messages, virus, or anything that can potentially harm the user's computer	"The link would likely be full of spam and possible viruses...."
privacy policy	The link leads to privacy policy, terms and conditions, or FAQ page	"I would be taken to another page full of text with their privacy policy that i most likely won't read or understand if i did read it."
privacy product ads	The link leads to ads for privacy or security products, or other products or services offered by the site	"It would take me to a site trying to sell services that protect my data from being sold."
selling policy	The link leads to more information about what things consumers can sell or not sell on this site	"It would show you the things that you can't sell on the site."
spamming	The link leads to settings that would bring annoying messages, e.g., send ads or unwanted emails	"The website would save your search info to target ads to you in the future"
user profile	The link will lead to the user profile.	"It would bring me to my account profile page"

Mapping of Tagline Expectation Codes for Regressions

Code	Multinomial Regression Code (correct/semi/incorrect)	Binary Regression Code (correct/incorrect)	conveys choice	conveys privacy beyond do-not-sell	conveys ability to opt-out of selling personal info	conveys misconception
account settings	semi	correct	yes	no	no	no
ask for more info	semi	correct	no	no	no	no
choices: generic	semi	correct	yes	no	no	no
choices: privacy	correct	correct	yes	yes	no	no
choices: data deletion	semi	correct	yes	yes	no	no
choices: do not sell	correct	correct	yes	no	yes	no
choices: opt-out	correct	correct	yes	yes	no	no
confirmation: do not sell	correct	correct	yes	no	yes	no
enforced: do not sell	semi	correct	yes	no	yes	no
expected: privacy protection	semi	correct	no	yes	no	no
garbage	EXCLUDE	EXCLUDE	NA	NA	NA	NA
give selling permission	incorrect	incorrect	no	no	no	yes
investment advice	incorrect	incorrect	no	no	no	yes
more info: products/services	incorrect	incorrect	no	no	no	yes

more info: data practices	semi	correct	no	yes	no	no
more info: do not sell	correct	correct	no	no	yes	no
more info: generic	semi	correct	no	no	no	no
more info: privacy protection	semi	correct	no	yes	no	no
new page	semi	correct	no	no	no	no
nothing	incorrect	incorrect	no	no	no	yes
not sure	incorrect	incorrect	no	no	no	no
other	EXCLUDE	EXCLUDE	NA	NA	NA	NA
request: do not sell	correct	correct	yes	no	yes	no
phishing/malware	incorrect	incorrect	no	no	no	yes
privacy policy	semi	correct	no	yes	no	no
privacy product ads	incorrect	incorrect	no	no	no	yes
selling policy	incorrect	incorrect	no	no	no	yes
user profile	semi	correct	no	yes	no	no

Appendix C-3: Codebook for the Opt-Out Icon + Tagline Combination Study

Icon-Only Expectation (for responses to "What do you think would happen if you clicked on the symbol in the highlighted area on this web page?")

Code	Definition	Example
accepted payment methods	The icon leads to information about what payment methods are accepted or not accepted on the website.	"I think that the symbol would redirect to a page that tells me about the type of payment options that are not available."
additional links	More links will be displayed	"There might be a dropdown of additional information links."
ask for more info	The icon leads to a survey, questionnaire or form for consumers to fill out.	"It will ask for my personal information."
choices: generic	The icon leads to more choices, without specifying what kind of choice it is.	"It would take you to some choices to look at what you prefer."
choices: privacy	The icon leads to privacy choices that are not exactly about selling or sharing information to third-party companies	"I would probably go to a page that allows me to opt out of certain information being stored on the site."
close area of website	Clicking the icon will close or exit something from being displayed.	"I think it would toggle the bottom area being displayed or not being displayed."
customize shopping experience	The icon leads to preferences related to the shopping experience, such as hiding prices or marking products as wanted.	"I would be allowed to make certain selections to customize a better shopping/browsing experience for that site."
enable/disable something	Something would be enabled/disabled or toggled on or off.	"Something would be toggled on or off."
enforced: do not sell	The user assumes that the do not sell request will definitely be honored by the company.	"My data will not be sold."

expected: privacy protection	The user will enjoy a higher level of privacy protection that does not relate to do not sell, e.g., no tracking will be applied.	"it could provide privacy for me."
more info: generic	The icon will lead to more information, without specifying what type of information it is.	"it would take me to a page with more info."
more info: products/services	The icon will lead to more info on the products and services sold on this website, as well as promotions or discounts.	"I believe it would take me to the next screen showing me a variety of shoes."
more info: symbol	The icon will lead to more info on what the icon means.	"I would be redirected to a information page that explains what the money symbol crossed out means."
more info: company/website	More info about the company or website, such as the Terms of Service or FAQ page.	"It would possibly give me more information about the website. I'm thinking it may be the fine print of the website."
new page	The icon will direct the user to a new page/site, open a new tab/window, without giving any further context of what's included in the page.	"It opens a web page."
not sure	The respondent has no idea what the icon means.	"I don't know."
no payment necessary	The user expects that the website will not require payment or payment info.	"I wouldn't be asked for payment."
privacy policy	The icon leads to privacy policy or info about privacy/security.	"I would be taken to another page full of text with their privacy policy that i most likely won't read or understand if i did read it."
warning/error	The icon leads to some type of warning or error message.	"An error message or something similar would open up explaining that I cannot buy the items through that link."

Mapping of Icon-Only Expectation Codes for Regressions

Code	Multinomial Regression Code (correct/semi/incorrect)	Binary Regression Code (correct/incorrect)	conveys choice	conveys privacy beyond do-not-sell	conveys ability to opt-out of selling personal info	conveys misconception
accepted payment methods	incorrect	incorrect	no	no	no	yes
additional links	incorrect	incorrect	no	no	no	yes
ask for more info	semi	correct	no	no	no	no
choices: generic	semi	correct	yes	no	no	no
choices: privacy	correct	correct	yes	yes	no	no
close area of website	incorrect	incorrect	yes	no	no	yes
customize shopping experience	incorrect	incorrect	yes	no	no	yes
enable/disable something	semi	correct	yes	no	no	no
enforced: do not sell	semi	correct	yes	no	yes	no
expected: privacy protection	semi	correct	no	yes	no	no
more info: generic	semi	correct	no	no	no	no
more info: products/services	incorrect	incorrect	no	no	no	yes
more info: symbol	semi	correct	no	no	no	no
more info:	semi	correct	no	no	no	no

company/website						
new page	semi	correct	no	no	no	no
not sure	incorrect	incorrect	no	no	no	no
no payment necessary	incorrect	incorrect	no	no	no	yes
privacy policy	semi	correct	no	yes	no	no
warning/error	incorrect	incorrect	no	no	no	yes

Tagline Expectation (for responses to "What do you think would happen if you clicked on the link in the highlighted area on this web page?"): please refer to the codebook for tagline expectation in Appendix C-2.

Icon-Tagline Expectation (for responses to "What do you think would happen if you clicked on the symbol and link in the highlighted area on this web page?"): similar to the tagline expectation codebook, with the following codes in addition.

Code	Definition	Example
more info: company/website	More info about the company or website, such as the Terms of Service or FAQ page	"It would possibly give me more information about the website. I'm thinking it may be the fine print of the website."
more info: collected data	More info on what types of data (or specific data) the site has collected about the user	"It would pull up information that the company has collected about me, possibly my demographics and what they think my shoe preferences are based on what pages I've spent time looking at."
more info: privacy choices	The link will lead to more information talking about how one can protect their own privacy or make use of this site's privacy settings	"There would be information regarding identity theft and how to protect yourself from becoming a victim."

Mapping of Icon-Tagline Expectation Codes for Regressions

Code	Multinomial Regression Code (correct/semi/incorrect)	Binary Regression Code (correct/incorrect)	conveys choice	conveys privacy beyond do-not-sell	conveys ability to opt-out of selling personal info	conveys misconception
more info: company/website	semi	correct	no	no	no	no
more info: collected data	semi	correct	no	yes	no	no
more info: privacy choices	semi	correct	no	yes	no	no

Interpretation of "Selling" "Information"/"Info" "Choices" and "Options" in the tagline:
please refer to the corresponding codebooks in Appendix C-2.