

# Evaluating browser-based cookie setting options to help the UK public optimise online privacy behaviours

Results report

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# Executive summary

## Synopsis

1. Most people accept and use cookies. Even in the experiment treatment group where the default was to decline cookies, 58% people decided to accept (80% was the highest acceptance rate across all the tests).
2. Not many people decline cookies. Only 39% declined cookies where that was the default setting was to decline cookies (17% was the lowest rejection rate across all the tests).
3. Many people (42%) may want to customise their cookie settings. Current cookie setting management systems make this difficult. With better design, we can help people achieve their privacy goals.
4. The design features of cookie settings appear to affect the choices people make.

## Policy context

Since the General Data Protection Regulation (GDPR) came into force on 25 May 2018, website owners wishing to collect data for statistics, advertising, monetisation and optimisation of their site must seek consent from their users.

Consent must be freely given, specific, informed and unambiguous. In order to obtain freely given consent, it must be given on a voluntary basis. The element “free” implies a real choice by the data subject ([GDPR, Recital 32](#)).

This definition of consent has led to the appearance of "cookie banners", on the vast majority of websites based in the UK and the European Union. However, several studies reveal that a significant portion of internet users overlook, or even ignore them (DMA UK, 2022). Some users prioritise speed and ease by opting for automatic acceptance, while at the same time expressing a desire to safeguard their data. This has been described as the ‘privacy paradox’ (Acquisti, 2004). It is especially problematic for cookie settings that appear website-by-website because of the time and cognitive burden of repeatedly choosing settings.

The Data Protection and Digital Information Bill addresses part of this issue by removing the need for organisations to seek consent for some non-intrusive uses of cookies (such as collecting anonymised data for statistical purposes), but consent requirements will remain for more intrusive uses (such as collecting data to micro-target web users with bespoke advertising).

Browser-based cookies settings are an alternative to the current website-based ones that could reduce burden on internet users and encourage them further to consider carefully their choice. Ministers have recognised that browser-based cookie settings may be an alternative to the current website-based ones that could reduce burden on internet users, and further encourage them to consider carefully their privacy choice when browsing the Internet. On this basis, the Department for Science, Innovation, and Technology (DSIT) has commissioned the Behavioural Insights Team (BIT)<sup>1</sup> to design a study that will evaluate whether the level at which

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<sup>1</sup> Disclaimer: please note that all opinions on privacy and the utility of cookies are BIT’s and do not reflect UK government intention or policy

the cookie settings are set and their design can address the privacy paradox by helping people make informed decisions that are consistent with their privacy preferences.

### Research objectives and design

Between August and December 2023, BIT designed, built, and tested an online experiment with 5,019 UK adults (18+). The goal is to inform DSIT policy of how best to facilitate informed privacy decisions, while reducing the burden of choosing settings website-by-website. Specifically, the research sought to identify the design features and default settings of browser-based cookie settings that could best enable informed decisions.

BIT designed an online experiment in which participants carried out basic online tasks in a simulated web browser, including selecting their cookie settings. The experiment contained five 'arms', each of which tested a different set of design features and default settings (see Appendix 2 for a detailed outline).

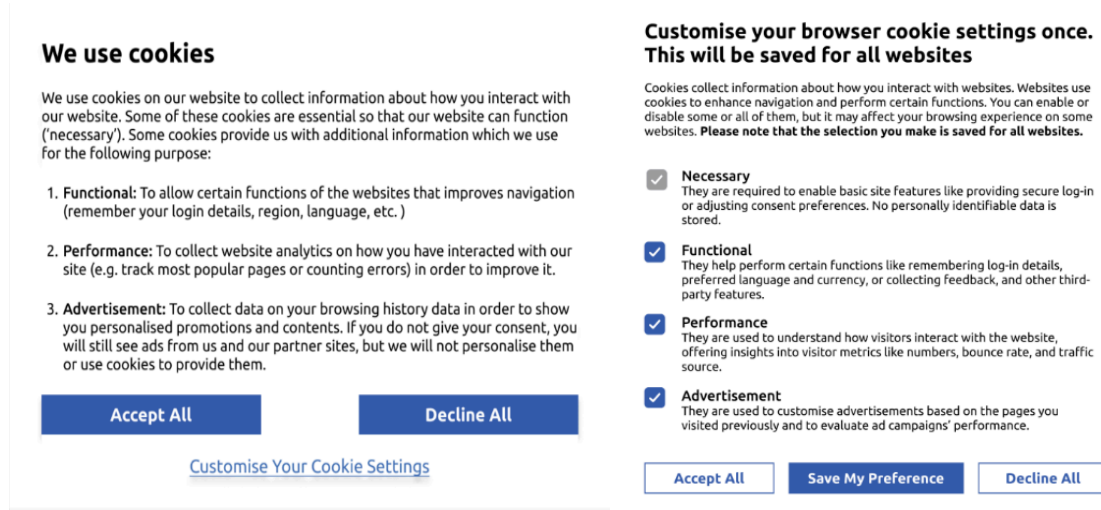
- 1) The "Control" arm reflects the current best practice for website-based cookies where options are presented neutrally with sufficient text to make an informed choice on each visited website.

The other arms were set at the browser-level, and participants only interacted with them once, when opening the homepage.

- 2) The "Opt-in" arm only includes the 'necessary cookies' pre-selected so respondents need to opt-in. This arm sets the default option to decline all.
- 3) The "Opt-out" arm includes all types of cookies pre-selected so respondents need to opt-out. This arm sets the default option to accept all.
- 4) The "Detailed" arm includes examples of data each cookie type collects, with the option of accepting/declining a more granular level of cookie settings. This arm aims to provide a greater sense of control over their data.
- 5) The "Scale" arm uses a sliding scale to select cookie setting options. This arm aims to make settings more interactive.

Core to the research was understanding what proportion of participants readily accept sharing their data; customise so they share some of their data some of the time to improve their user experience with cookies' functionalities; or decline sharing any data and forgo all cookie functionalities. We created three profiles to capture these differences: acceptors, customisers, and decliners.

Figure 1: Examples of design differences (“Control” on the left, “Opt-out” on the right), please see Appendix 2 for full details.



## Results

We compared four different browser-based cookie setting options to the current website-based one<sup>2</sup> (the “Control” arm) to see how internet users’ choices change with different default options and different levels of information. We found that:

- 1) Based on participants’ stated preference (see the “Expected” line in Figure 2 below) 53% should accept all cookies, 42% should customise their settings because they want to trade-off data sharing and privacy, while 5% should decline all cookies.
  - a) Rates of customising and declining cookies were closest to these stated preferences in the two arms which gave the most detail about functionalities and easily accessible opportunity to customise, “Detailed” and “Scale”, see Figure 2 below.
- 2) Participants in the “Control” arm, who saw current best practice website-level cookie setting options, had (almost) the highest rates of participants accepting all cookies (78% vs the “Opt-out” arm’s 80%), with none customising.
  - a) These results are the furthest from the stated preferences of all the participants.
- 3) Similarly far from stated preferences is the “Opt-out” arm in which participants saw all types of cookies pre-selected so the default action is accepting, had only a small proportion customising (4%), and declining (17%). As rates are close to what is observed in the “Control” arm, it suggests that the level at which the cookie settings are set, did not affect participants’ choice and that their design was a more important factor.
- 4) Importantly, the opposite arm, “Opt-in”, in which participants saw only the ‘necessary cookies’ pre-selected so the default action is declining, had higher than expected accepting (58%), increase in declining (39%), and still the same customising (4%).
  - a) These results highlight how ingrained accepting cookies has become.
- 5) The “Detailed” and “Scale” arms saw respectively 8% and 14% of participants customising, suggesting that novel ways of presenting cookie settings can further encourage them to engage with their choice.

<sup>2</sup> The website-based cookie pop-up was created to mimic current recommended best practices.

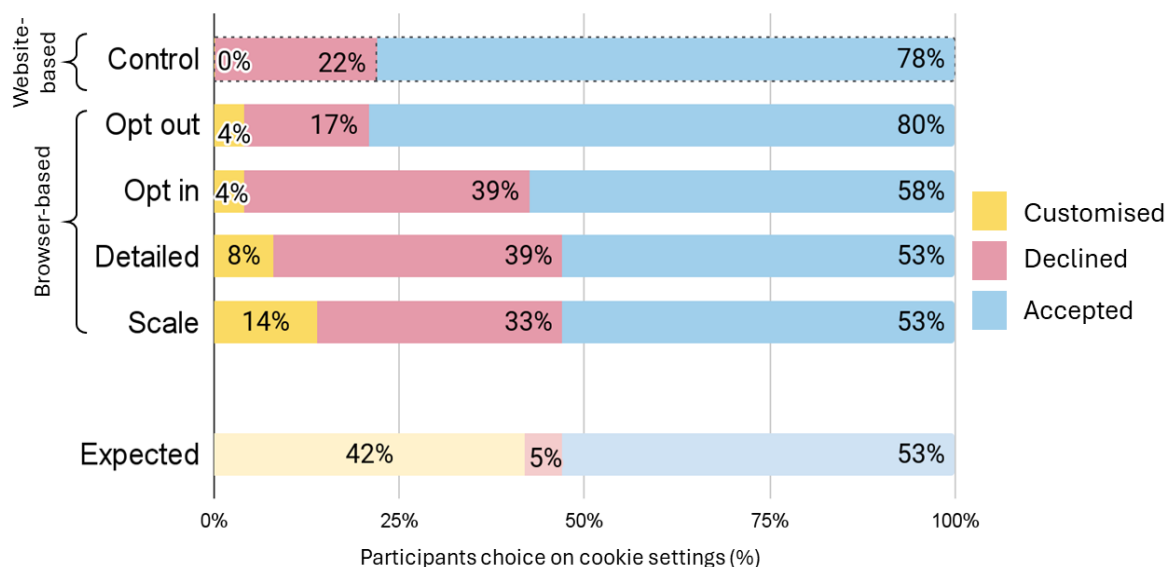
- 6) Satisfaction rates increased when participants had more details and re-evaluated their automatic ‘knee-jerk’ response of accepting/declining all cookies.
  - a) Even a majority of participants classified as acceptors who nevertheless declined/customised reported being satisfied with their choice, despite declining/customising requiring more time to complete than accepting.

### Conclusions and recommendations

We found that some of the created browser-based cookie settings can enable participants to align closer to their stated preferences than the current website-based system; however, we observed large differences across them, that seem to be driven by the design features of cookie settings, rather than the level at which they are set at (see finding 14).

We recommend that any future cookie setting option should be interactive and detailed to a sufficient level that participants understand the real-world impact of accepting or declining a number of different options, e.g. that ‘functional’ cookies include login details, website preferences (language, currency), see Appendix 2, Figure 5. These setting designs secure stronger engagement by breaking participants out of the habit of automatically accepting all cookies purely for the sake of expedient access to the browser; furthermore, participants are satisfied after such a process of critical engagement.

*Figure 2: Participants’ self-reported preferences (bottom “Expected” line) and their actual choice for each of the experiment’s 5 arms.*



### Report structure

This report starts with the broader findings about the participants, e.g. rates of comfort with sharing data in general and per cookie type, and rates of accept-decline as Findings 1-3. Experiment results, starting with the “Control” arm, begin from Finding 4, and Findings 12-17 are about sentiments, e.g. satisfaction with the information provided in general and your choices specifically, and attitudes towards browser-based cookie settings.

Please see the appendices for results with subgroup analyses (which are exploratory, and the presence, or absence, of difference is to be interpreted carefully), and images of each experiment arm.

## Introduction

### The problem: the privacy paradox, and the new policy context

We share our data daily, but most of us do not understand either the details of what we're sharing, with who, or the implications of how it's used. Users prioritise speed and ease by opting for automatic acceptance, while at the same time expressing a desire to safeguard their data. This has been described as the 'privacy paradox' (Acquisti, 2004). A 2023 YouGov and Proton survey of over 2,000 UK adults found that 77% are concerned about privacy online, yet only 31% say that they decline marketing cookies (YouGov, 2023). The privacy paradox arises from a multitude of factors, including the convenience and benefits offered by online services, lack of awareness about data collection practices, and the trade-offs individuals are willing to make for personalised experiences (Acquisti, 2004; Barth & De Jong, 2017; Solove, 2020).

Our thinking about privacy has been evolving over the last decade, high-profile events, such as data breaches, have brought privacy concerns to the forefront of public consciousness. These incidents highlight the vulnerabilities of personal information in the digital age, leading to increased awareness and a sense of urgency regarding privacy protection. The advent of social media and the rise of sharing culture, the ease of sharing personal information, photos, and experiences, blurs the boundaries between public and private spheres. Now we are more cognisant of the vast amounts of data being collected, often without our explicit knowledge or consent.

The European Union's General Data Protection Regulation (GDPR) that underlies UK's GDPR and other legal developments, influences thinking about privacy, underscoring individuals rights, prompting discussions about data ownership, consent, and the need for greater transparency and accountability from organisations handling personal information. GDPR requires the public to make an informed decision about privacy. Website-level cookie banners can undermine this informed decision: by requiring the cookie selections multiple times a day, some people can see the task as an annoyance, and revert to accepting cookies as the fastest way to progress through the burden.

The [National Data Strategy](#) sees data as a strategic asset and its responsible use as an opportunity; however, the complexity of regulation means that consumers, businesses, and public sector organisations are not yet taking full advantage of the benefits available through effective data sharing. Unlocking the power of data is one of the government's 10 Tech Priorities, and in March 2023 the government introduced the Data Protection and Digital Information Bill (DCMS, 2023), now under the Department for Science, Innovation, and Technology (DSIT).

The Data Protection and Digital Information (DPDI) Bill introduces new exceptions to the consent requirement for certain purposes that are considered to present a low risk to people's privacy. The Bill will also allow the Secretary of State to remove the need to seek consent for other purposes, including those that may be more intrusive, in the future when consent management tools are readily available. The aim is to offer the user a clear, meaningful choice that can be made once, and respected throughout their use of the internet.

## Overview and objectives of this research

The Behavioural Insights Team (BIT) developed an online experiment to test internet browser cookie setting options on behalf of the DSIT. We sought to understand how UK consumers might respond to different versions of potential future browser-based systems in response to changes in cookie consent requirements under the DPDI Bill, as opposed to the current state whereby people set their cookie settings website-by-website. While several studies have already shown how the design of website-level cookie settings can influence web users' choice (BIT, 2023; Utz et al, 2019; Habib et al, 2022), no study evaluated the added-value of browser-based cookie settings. This distinction between selecting settings website-by-website, compared to once-per-browser, is a core component of our experiment to understand how to secure engagement and informed choice when facing cookie settings.

We developed a simulated online browsing experience, and then with DSIT co-designed five different cookie settings<sup>3</sup> (called trial 'arms'), with each arm testing a different type of cookie setting options, e.g. one where all cookies are pre-selected (called "Opt-out"); no optional cookies selected (called "Opt-in"); providing more vs less detail. Please see Appendix 2 for images of the interfaces participants in each trial arm were presented. We recruited 5,019 UK adults, and then allocated them randomly between the five trial arms evenly. We included questions in the experiment to test respondents' comprehension and ability to make informed choices, including selecting cookie settings that match their individual privacy preferences.

The overall research questions we sought to answer were:

- 1) What is the public's understanding of differences between types of cookies?
- 2) What is the public's behaviour, and which designs of cookie setting options (e.g. quantity of information, interface of selection) help people make choices that align with their preferences, including whether behaviour differs when framed as a one-time setting for all websites?
- 3) What are public perceptions of the idea of potential browser-based cookie systems?

## Creating the cookie setting options

We designed the five cookie setting options together with DSIT:

- 1) The "Control" arm reflects the current best practice of presenting options neutrally with sufficient text to make an informed choice on each visited website;

The other arms were set at the browser-level, and participants only interacted with them once,

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<sup>3</sup> These cookie settings are not currently under consideration by the UK government. Instead, they have been designed based on evidence of what is deemed most promising in the literature, what needs more evidence to build support, and what is most applicable and scalable.



when opening the homepage.

- 2) The “Opt-in” arm only includes the ‘necessary cookies’ pre-selected so respondents need to opt-in. This arm sets the default option to decline all;
- 3) The “Opt-out” arm includes all types of cookies pre-selected so respondents need to opt-out. This arm sets the default option to accept all;
- 4) The “Detailed” arm includes examples of data each cookie type collects with the option of accepting/declining a more granular level of cookie settings. This arm aims to provide a greater sense of choice and control over their data;
- 5) The “Scale” arm uses a sliding scale to select cookie setting options. This arm aims to make settings more interactive.

Please see Appendix 2 for images of each trial arm cooking setting interface.

## Methodology

### Experimental design

We designed the experiment to replicate ‘real life’ insofar as possible. We built a three phase Randomised Control Trial to compare participants’ stated preferences with their revealed preferences. We created three websites that mimic popular pages, each with its own task - such as reading the news, or finding items when shopping online - designed to reduce the risk of desirability bias or priming.

Participants were initially told that they would do online tasks and then be asked questions about them. This was a decoy so we could track their interactions with the cookie setting options (see appendix 3 for more detail on the decoy task). In the treatment arms, when participants opened the browser to start their task they were prompted with a cooking settings pop-up that varied in design depending on the trial arm participants were in. From there participants could accept all, decline all or customise the settings, and their selections were recorded. The control group saw setting options on each website, rather than on the browser homepage when they initially opened the browser. After the tasks, participants saw a survey to investigate their privacy intentions, understanding of cookies, satisfaction with choices, and satisfaction with the setting options.

### Three categories of research questions

The research sought to analyse three aspects of browser cookie selection: understanding and knowledge about the choices participants make, behaviours during selection, and the sentiments surrounding selection, to gain a fuller understanding of the desirability of each design simply measuring rates of accept-customise-decline.

**1. Understanding and knowledge**, assessing the effect of the cookie setting options on users’ knowledge and understanding by asking:

- 1) Do participants understand what cookies do and what data they collect, and what for?
- 2) Do participants understand the level (browser or website) to which the cookie settings apply ?
- 3) Do participants make choices that align with their stated privacy preferences?

**2. Behaviour when making cookie choices**, evaluating the effect of the setting options on web users' choice by measuring:

- 1) The choices they make (level of privacy chosen: do they accept/decline all, choose to personalise).
- 2) The time they spend on a cookie pop-up (as a proxy of effort required to interact with the pop-up).

**3. Sentiment**, assessing opinions and perception of the setting options and the way they are presented by measuring:

- 1) Are participants satisfied that their choices match their preferences?
- 2) Are participants satisfied with the level of information provided?
- 3) Are participants satisfied with the ease of selecting an option that matches their preferences?
- 4) Do participants view cookie management systems as trustworthy?
- 5) Do participants approve of the idea of browser-based cookies, and what features would they like to see if such a system was introduced (preferred functionalities, frequency of updates)?

### Study limitations

**The behaviour is simulated in an online trial.** While the website was made to feel as real as possible, the observed behaviour may not replicate in a real situation. This does not affect the validity of the comparisons between the different trial arms within the experiment, but does mean that the behaviour we observed may not be generalisable beyond this study.

**Exclusion of the digitally excluded.** Participants were recruited via an online panel provider. This does not affect the external validity of the comparisons made as the target audience are those who browse the Internet, and would therefore come across cookie settings.

**A “Control” arm representing best-practice rather than common practice.** Despite slightly lower representativeness, this allows us to make sure the effectiveness of the settings tested is compared to what is currently suggested, rather than what is currently being done, for which recent studies find websites using a range of ‘dark patterns’ that manipulate users to secure their consent (Soe and Nordberg, 2020).

**Potential statistical noise through repeated significance testing.** Splitting the data into subgroups multiplies the number of statistical tests conducted; therefore, spurious statistically significant relationships are more likely to occur through random chance (Type I errors). Therefore, all subgroup analyses are exploratory and the presence, or absence, of difference is to be interpreted carefully, more research and larger samples would be required to be able to draw causal explanations. Each graph and table with statistically significant data includes an explanation.

### Sample description

We recruited a sample of 5,019 UK adults (18+). The sample is relatively representative of the

UK population<sup>4</sup> on the following characteristics :gender; age; income; employment status; region; ethnicity). Considering cookie selection can depend on the device used to access the internet, we ensured an equal division between mobile and computer users. The entire sample was regular internet users. None of the respondents used the internet less than once a day, with 98%<sup>5</sup> using the internet many times a day. 61% use the same browser for all online activity, 36% use different browsers depending on the task, and 3% don't care which browser they use, opening the first they see. The equal division between mobile and computer users was a deliberate decision by DSIT considering design and accessibility differences, which influence behaviour.

*Figure 3: Description of the research participants.*

Gender		Income		Employment status	
Women	53%	<20k	23%	Employed	68%
Age		20-40k	32%	Unemployed	3%
18-24	14%	40-60k	24%	Homemakers	4%
25-54	59%	>60k	21%	Retired	10%
55+	28%			Student	13%
				Disabled	2%

<sup>4</sup> Based on ONS statistics available at:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalescotlandandnorthernireland>

<sup>5</sup> This figure is slightly higher than the one reported in a recent [DCMS report](#), however this is not an issue, or surprising, as our target population was internet users.

# Results

The results of this report are divided into five sections:

- 1) Participants' data privacy preferences: understanding preferences in terms of data sharing and user experience when browsing websites.
- 2) Participants' choice when facing cookie settings: measuring how design affects choice.
- 3) Participants' experience of the choice: understanding whether some designs can lead to more satisfaction and alignment with personal preferences.
- 4) Participants' opinions towards cookie settings options: measuring ease of navigation and satisfaction with the interface.
- 5) Participants' attitudes towards browser-based cookie settings: understanding the desired type and frequency of interactions.

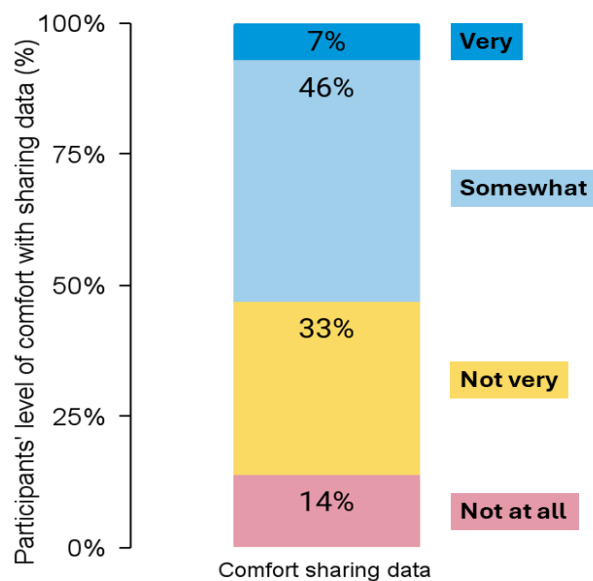
## Participants' data privacy preferences

We asked participants what their data sharing and user experience preferences were. This allowed us to measure whether one, or more, cookie settings effectively encourages participants to make a choice that reflects their stated preferences.

### Finding 1: Participants' level of comfort with data sharing is diverse

Over half of participants (53%) reported being "somewhat/very comfortable" with sharing their data with websites and organisations. The remaining participants (47%) reported being "not very/not at all" comfortable with that idea (Figure 2). In line with other studies (DMA UK, 2022), participants aged 18 to 54, are more comfortable sharing their data (56-58%) compared to participants 55 and older (44%) (see Appendix 1, Table 1). We did not find any differences between the 18 to 24 and 25 to 54 age brackets.

Figure 4: Comfort sharing data with websites and organisations.

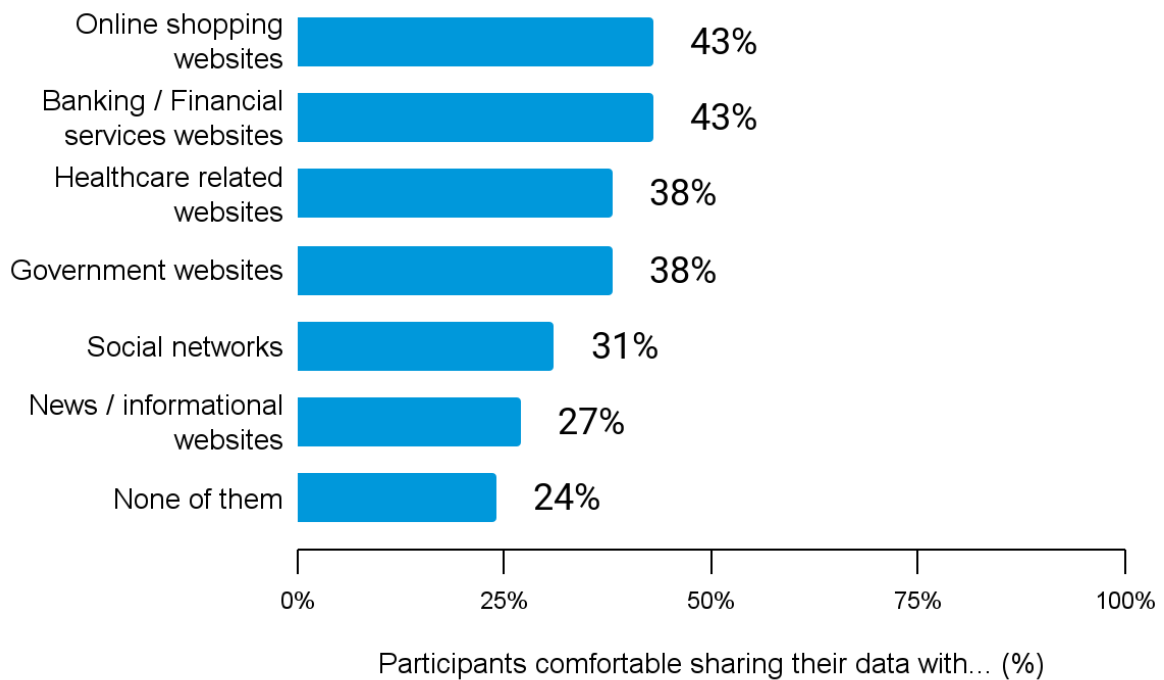


**Question:** How comfortable do you feel sharing data with websites/ organisations? (N=5,019)

This gives us a first indication of the expected acceptance rate when participants are facing cookie settings. If a cookie setting facilitates a decision in line with individuals' data privacy preferences, we would expect no more than 53% of them to agree to share their data (assuming they understand that accepting cookies means sharing their data).

Comfort levels also vary across website types, a slightly larger proportion of participants reported being comfortable with sharing their data with “online shopping websites” (43%), “banking/ financial services websites” (43%) than “social networks” (31%) or “news/informational websites” (27%) (see Figure 3). It is also worth noting that 1 in 4 participants (24%) are not comfortable sharing their data with any of these types of websites / organisations, and that only 6% of participants indicated being comfortable sharing their data with all websites and organisations listed.

Figure 5: Comfort levels with sharing data by websites and organisations.



**Question:** Which of the following websites would you feel comfortable with recording your personal information including login details, website preferences and your browsing history? (N=5,019)

Differences in comfort levels might stem from what participants expect when they share their data, e.g. a personalised experience or access to essential services. For social networks and news websites, they might see less value in sharing their data, feel more concerned about how social networks handle their information, and trust organisations to different degrees.

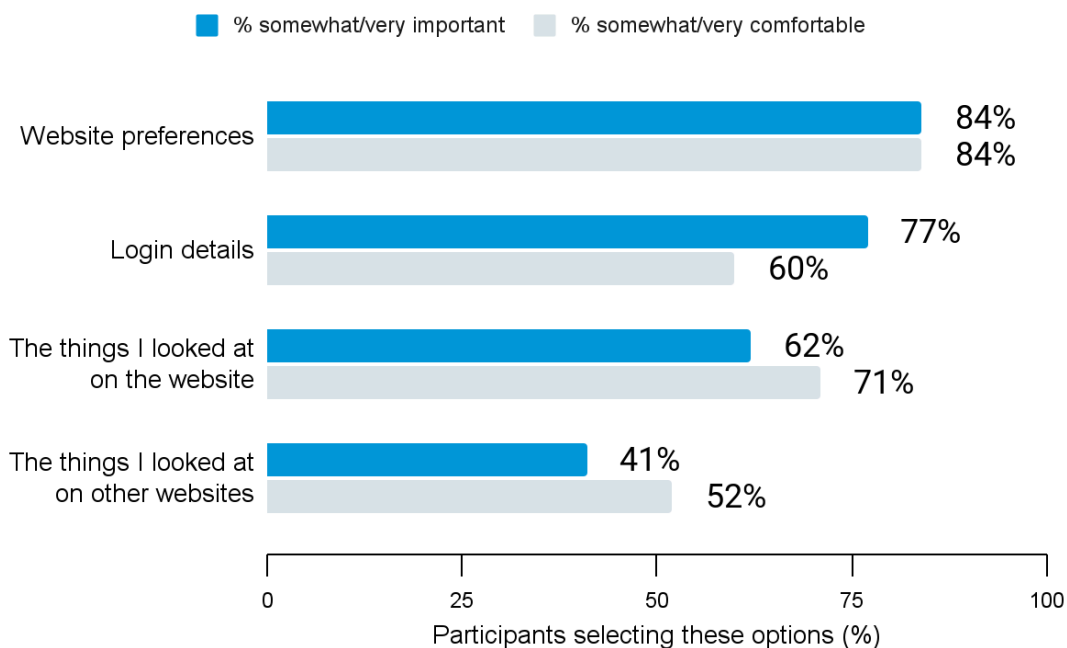
This means that we could expect participants' selection to vary across websites, however in the control group, where participants were asked to select their cookie preferences each time they opened a new webpage, 94% selected the same setting for all three websites. This may be because selecting cookies has become habitual, and peoples' selections do not vary between websites. Despite this low variation in the control group, over half of participants overall (54%) said that being able to have different settings for different types of websites would be an important feature for them if browser based cookie management systems were to become generalised. Allowing people to tailor their preferences by website type might be an important feature to add for browser-based cookie systems.

### Finding 2: More participants care about sharing functional cookies than they do about advertisement cookies

Figure 6 shows that around 8 in 10 participants (84%) care about practical functionalities like websites remembering their preferences (e.g. currency, or

language).<sup>6</sup> However, a lower proportion (6 in 10) consider it important for a website to remember their on-site activities, and even fewer (4 in 10) think that it is important for websites to remember what they viewed elsewhere. This again reflects that participants tend to value practical functionalities where advantages for their user experience are obvious or immediate.

*Figure 6: Importance of different cookie functionalities and levels of comfort with sharing data related to these functionalities.*



**Question:** Imagine you visit the same website more than once, how important is it to you that the website does the following things? / Imagine you are navigating on a website, how comfortable are you with that website recording the following information? (N=5,019)

**Note:** Website preferences and login details are functional cookies while the things they looked at on other websites are advertisement cookies. Things web users look at on the websites are performance cookies. For the question on importance, we specified that advertisement cookies were used to show them personalised adverts (i.e. “Show adverts based on the things that I looked at on other websites (e.g., news or products I looked at on a different website)”).

Figure 6 also reveals that a majority of participants (84%) are comfortable with sharing data related to their website preferences, including preferred language and currency. Moreover, 71% express comfort in sharing information about their on-site activities. These rates of readiness to share data surpass those observed earlier when participants were asked to think about their data sharing preferences generally. This implies that individuals may not typically consider such specific details when thinking about data sharing, and instead think about it in broader terms.

Conversely, there is a lower comfort level when it comes to websites retaining login details, with only 60% expressing they would be “somewhat/ very comfortable” sharing this data, likely influenced by the perceived privacy associated with such information. Similarly, only half of respondents (52%) feel “somewhat/very comfortable” with the

<sup>6</sup> These functionalities are encompassed by what is commonly called “functional cookies”.

idea of sharing data across websites. These findings show that web users might have different readiness to share their data based on the perceived benefits or the perceived intrusiveness.

### **Finding 3: Most people should accept or customise their settings.**

We can understand cookie preferences as being shaped by two main factors - how important people consider the functionalities the cookies provide, and how comfortable they are with sharing their data with websites and organisations (Naeem et al, 2022).

We anticipate that someone who is comfortable with sharing their data, regardless of how important cookie functionalities are to them, will accept cookies. In contrast, someone who is not comfortable with sharing their data and does not find the functionalities important, should decline.<sup>7</sup> Those who are uncomfortable with sharing their data, but still care about some cookie functionalities, should customise accordingly.

Based on survey responses, we divided participants into three personas. Thanks to randomisation, the persona groups are evenly distributed across trial arms. The majority of participants sat either in the “acceptors” or the “customisers” persona group:

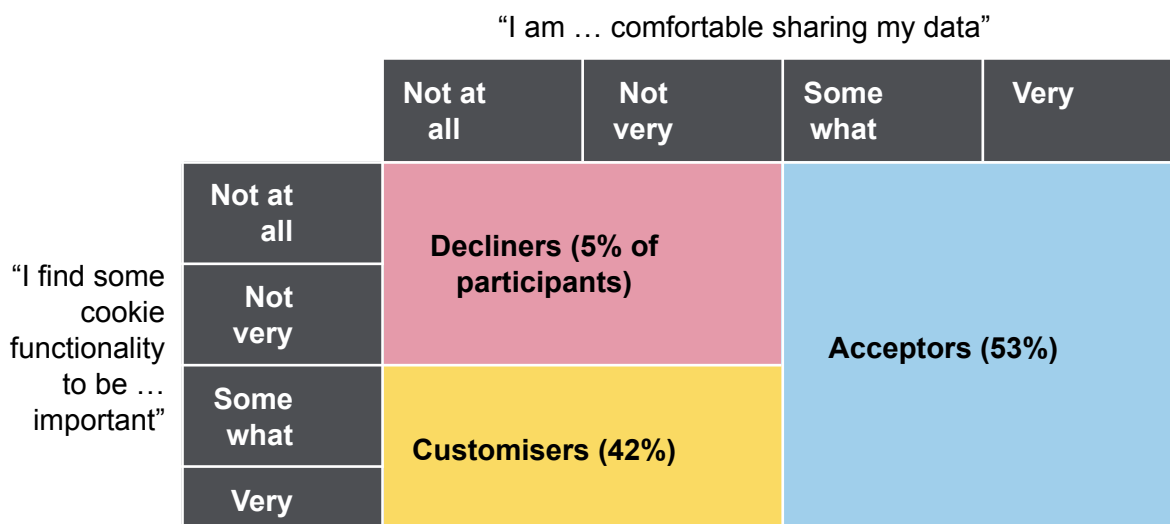
- **Acceptors**, 53%: those who were “somewhat / very comfortable” with sharing their data, regardless of how important the cookie functionalities were to them.
- **Customisers**, 42%: those who were “not at all / not very comfortable” with sharing their data, and reported finding some cookie functionalities “not at all / not very important”.
- **Decliners**, 5%: those who were “not at all / not very comfortable” with sharing their data, and reported finding no cookie functionalities to be “somewhat / very important”.

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<sup>7</sup> For feasibility and ease of interpretation, this experiment uses a simplified model to categorise people, whereas in reality the line between accepting and customising is rarely as clear. Participants might consider these factors with different levels of attention and emphasis, or include other factors in their reflection.



Figure 7: Cookie Personas distribution.



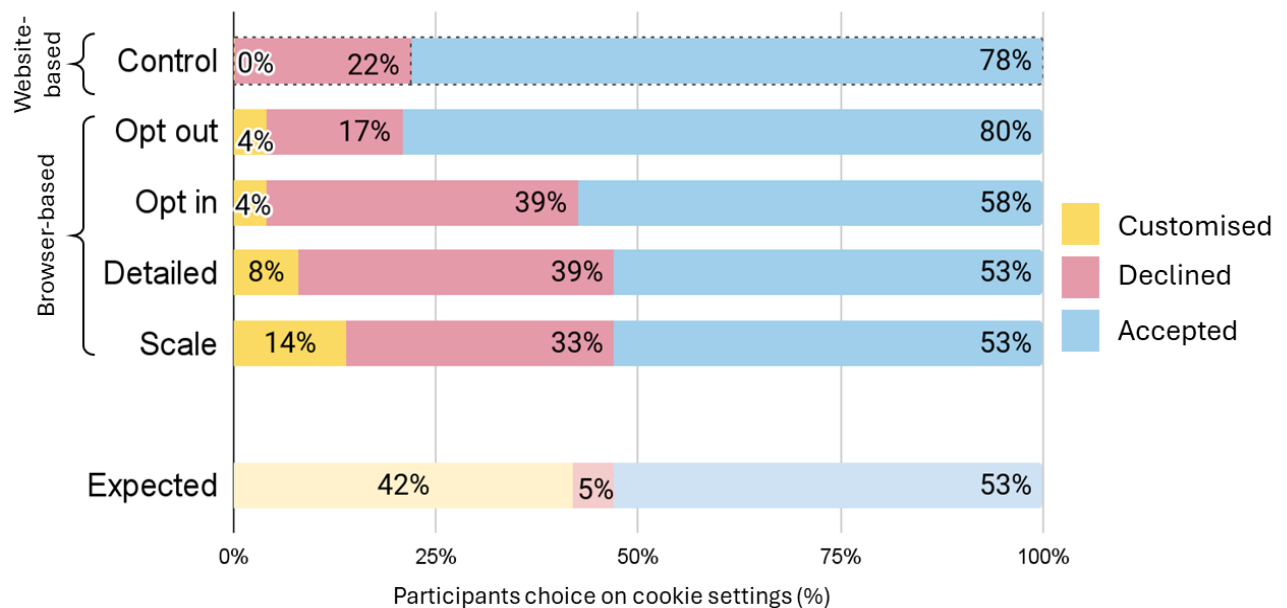
This means that if we define preference as a combination of their user experience preference and their comfort with data sharing<sup>8</sup>, when participants are facing cookie settings, 53% of them should accept, 42% should customise, and 5% should decline. Further analyses show that decliners and customisers are both more likely to be older or earning less (see Appendix 1, Table 2) - both factors that are linked with lower digital literacy levels, a known determinant of data-protective preferences (Benevento et al, 2023).

### How cookie setting designs impacts choice

To judge the desirability of a cookie management system, one of the main criteria that needs to be considered is how its design affects choice. The graph below summarises the main findings around participants' choice when facing the different cookie management systems created for this experiment.

<sup>8</sup> The criteria and cutoffs used for this definition will influence the size of each segment. Studies using other definitions might find different proportions or even different personas.

Figure 8: Participants' choice when facing different cookie setting options across each of the five experiment arms.

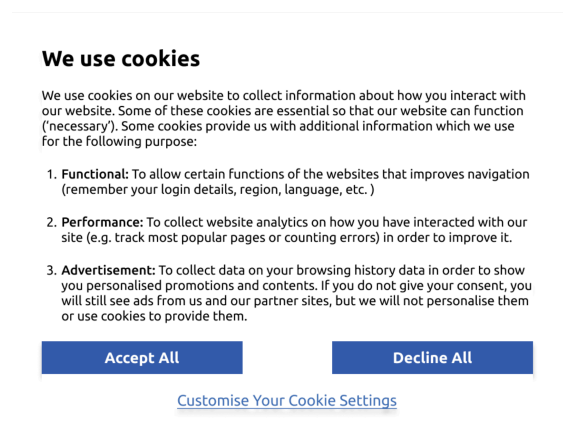


**Note:** Proportion of participants choosing to either customise, decline or accept all cookies when facing a cookie management system. (N=5,019). The bottom “Expected” bar reflects the distribution of participants according to their stated preferences. It shows the proportion of acceptors, decliners, and customisers we should see if a cookie setting allows them to reflect their true preferences.

In the control group, participants were recorded as having accepted if they accepted all cookies on any of the three website-level cookie settings. If they had not accepted at all, we display their choice selection from the first website.

#### Finding 4: A majority of web users will accept all cookies when facing a neutral website-level cookie system.

When facing a website-level cookie system presenting choices in a neutral way (the “control”, see Appendix 3, Figure 1), the currently recommended design, 78% of participants accepted all cookies, 22% declined all and none customised (see Figure 5). These rates are far from what we would expect to see if cookie setting options encouraged participants to make a choice that is aligned with their stated preferences. However, they are similar to other studies testing similar designs of website-level cookie systems (BIT, 2023; Utz et al, 2019).



The limited engagement with cookie customisation could stem from the fact that users are required to click on a hyperlink that is a less visible option. This process demands more effort, involving additional clicks, compared to the relatively straightforward options of accepting or declining all cookies. Given that individuals spend an average of 5 hours and 37 minutes on the internet daily (Digital Report, 2021), the prospect of

customising cookies on each visited website becomes a tangible burden (considering people are online several times a day), contributing to the observed lack of active participation in this aspect of online privacy management.

### Finding 5: Presenting the acceptance of all cookies as the recommended option, by pre-selecting all optional cookie functionalities, does not affect choice compared to neutral cookie systems.

Presenting the default setting as all cookies being pre-selected (the “Opt-out” trial arm) did not notably influence choices compared to the control group (17% declined when seeing the former, 22% when seeing the latter). Even though participants were invited to customise in the “Opt-out” arm, and there were tick boxes to do so, the lack of difference implies that individuals may have already formed a habit of accepting all cookies. In fact, when asked about their decision to accept the use of cookies, the predominant reasons cited were “out of habit” (44%) and “because it was the fastest option” (30%) (see Appendix 1, Table 4).

This reaction to accept all cookies remains, even if the level at which the cookie choices are applied differ (website-level for the neutral “Control” and browser-level for the “Opt-out”). This suggests that such a type of cookie setting is insufficient to encourage participants to engage with their choice, even if they have to do it once, rather than on all websites. The tendency to privilege speed without taking time to read cookie settings remains.

### Finding 6: Presenting decline all cookies as the recommended option encourages more participants to decline their use.

Presenting only necessary cookies as the default (the “Opt-in” arm) increased rejection rates in the “Control” group from 22% to 39%. This could be explained by the above-mentioned tendency to accept the pre-selected option, here by clicking “Save my Preference”, which requires less cognitive effort, and which we think has been selected for us according to our interests (Jachimowicz et al, 2019). Another plausible explanation is that presenting decline as the default creates dissonance for internet users used to seeing acceptance as the recommended choice (like in the Opt-out arm). This dissonance may prompt them to question their habitual acceptance and encourage a

**Customise your browser cookie settings once. This will be saved for all websites**

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

- Necessary**  
They are required to enable basic site features like providing secure log-in or adjusting consent preferences. No personally identifiable data is stored.
- Functional**  
They help perform certain functions like remembering log-in details, preferred language and currency, or collecting feedback, and other third-party features.
- Performance**  
They are used to understand how visitors interact with the website, offering insights into visitor metrics like numbers, bounce rate, and traffic source.
- Advertisement**  
They are used to customise advertisements based on the pages you visited previously and to evaluate ad campaigns' performance.

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They are required to enable basic site features like providing secure log-in or adjusting consent preferences. No personally identifiable data is stored.
- Functional**  
They help perform certain functions like remembering log-in details, preferred language and currency, or collecting feedback, and other third-party features.
- Performance**  
They are used to understand how visitors interact with the website, offering insights into visitor metrics like numbers, bounce rate, and traffic source.
- Advertisement**  
They are used to customise advertisements based on the pages you visited previously and to evaluate ad campaigns' performance.

reevaluation of their choice. These two explanations are not mutually exclusive: in all likelihood some respondents declined cookies because it was the default option, while others arrived at the same conclusion through the dissonance pathway.

### Finding 7: Providing more granularity in choice can further encourage customisation

Participants who saw the “Detailed” cookie settings are twice as likely (8%) to customise their choice than those who have seen “Opt-in” (4%) or “Opt-out” (4%) settings. This rate of customisation is also a notable increase from the “Control” group where 0% customised. This indicates that presenting cookie options in a novel way, e.g. offering more granularity of detail with tangible examples, has the potential to disrupt habitual behaviour and increase engagement. In fact, participants who saw this browser-based setting spent more time (18 seconds) reading it than those who saw the “Control” (3 seconds), “Opt-in” (15 seconds) or “Opt-out” (15 seconds) settings, suggesting additional reflection / surprise time that nevertheless remains reasonable (see Appendix 1, Table 5).

#### Customise your browser cookie settings once. This will be saved for all websites

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

- Necessary**  
They are required to enable the basic features of this site, such as providing secure log-in or adjusting your consent preferences. These cookies do not store any personally identifiable data.
- Functional**
  - Remember my login details
  - Remember my website preferences (e.g., language, currency)
  - Show media content present on the websites (e.g. videos)
- Performance**
  - Count how many visitors there are on the website
  - Record how I interact with the website (pages visited, time spent)
- Advertisement**
  - Collect information based on my web browsing activities, for example, to personalise adverts
  - Share the information collected with other partnered organisations, for example, to measure the effectiveness of adverts

Accept All Save My Preference Decline All

### Finding 8: Providing a new interactive way to think about our cookie preferences seems most efficient in increasing engagement with cookie settings (of all the options tested)

Participants who saw the “Scale” settings were even more inclined to customise their choices, with 14% opting to do so. This figure is nearly twice as high as observed with the “Detailed” settings, which stands out as the next most effective in encouraging customisation, and 3.5 times greater than rates seen in the “Opt-in” or “Opt-out” settings. This result shows that asking participants to think directly about their privacy preferences in an interactive way, such as by placing themselves on a scale, can effectively disrupt habitual decision-making and encourage choices that better align with their preferences.

#### Customise your browser cookie settings once. This will be saved for all websites

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

Let us know how you feel about sharing your information with websites and we'll let you know which cookies you should accept or decline.



I would rather **not share my data** and not have a personalised experience.

I would rather **share my data** and have a personalised experience.

See more details ▾

Accept All Save My Preference Decline All

### **Finding 9: Declining on a computer remains easier than on a mobile device.**

Overall, rates of acceptance are higher on mobiles than on computers<sup>9</sup>, but the general differences across arms remain, with higher rates of customisation on the “Detailed” and “Scale” settings and higher rates of acceptance in the “Control” and “Opt-out” settings (see Appendix 1, Table 3). Previous studies have found similar results (Utz et al, 2019). This difference might be due to the fact that “decline all” can require further scrolling on smaller phone screens.

### **How cookie setting design impacts experience**

The desirability of a cookie management system cannot be judged solely by the refusal/customisation rates it generates. It is also important to consider if people’s choice matches their privacy and user experience preferences, if they are happy with their choice, how much time they spent on the settings, how well they understand them, and if they are satisfied with the cookie management systems more generally. For example, if the refusal rate is higher, but the time spent on a settings is too short or conversely too long, or if it generates negative feelings, then the desirability of a settings could be questioned.

The following section explores how the design of the settings affects these other criteria.

### **Finding 10: Rates of alignment with stated preferences were similar across all cookie settings options.**

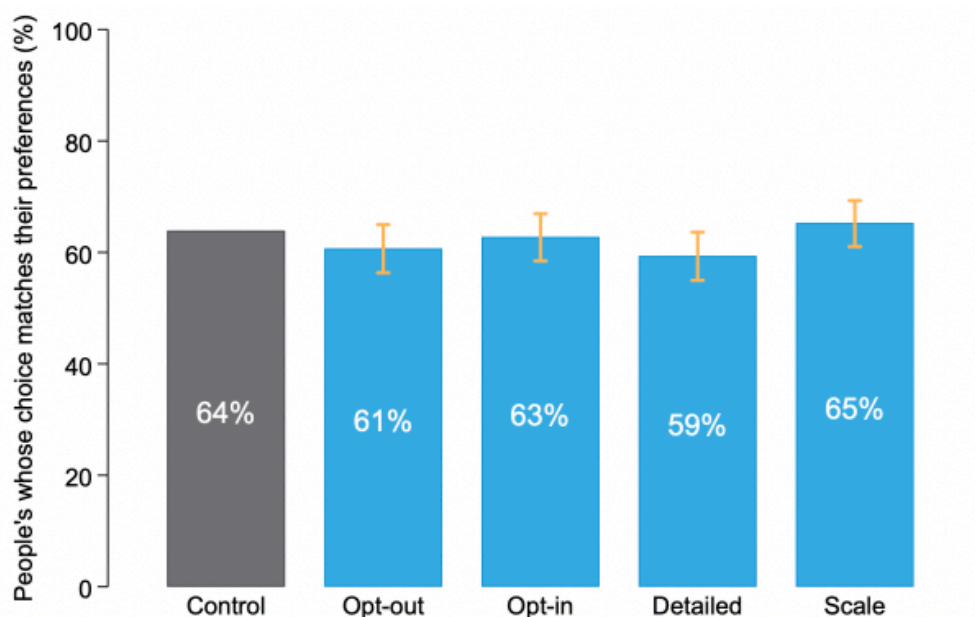
Participants exposed to the browser-level cookie settings did not make a choice that is more aligned with their preferences than those exposed to the current best practice website-level one<sup>10</sup> (see Figure 9 below).

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<sup>9</sup> Note that a small amount of participants (<100) used tablets and analyses cannot be run on such small sample. They were therefore counted as computer users, as tablet screens tend to be larger, meaning that their user experience will be closer to that of computer users rather than phone users.

<sup>10</sup> Someone is aligned with their preferences if they accepted/customised/declined and their answers to the survey questions placed them in the corresponding persona, i.e. as an “acceptor”/“customiser”/“decliner”

Figure 9: Rates of alignment with preferences.



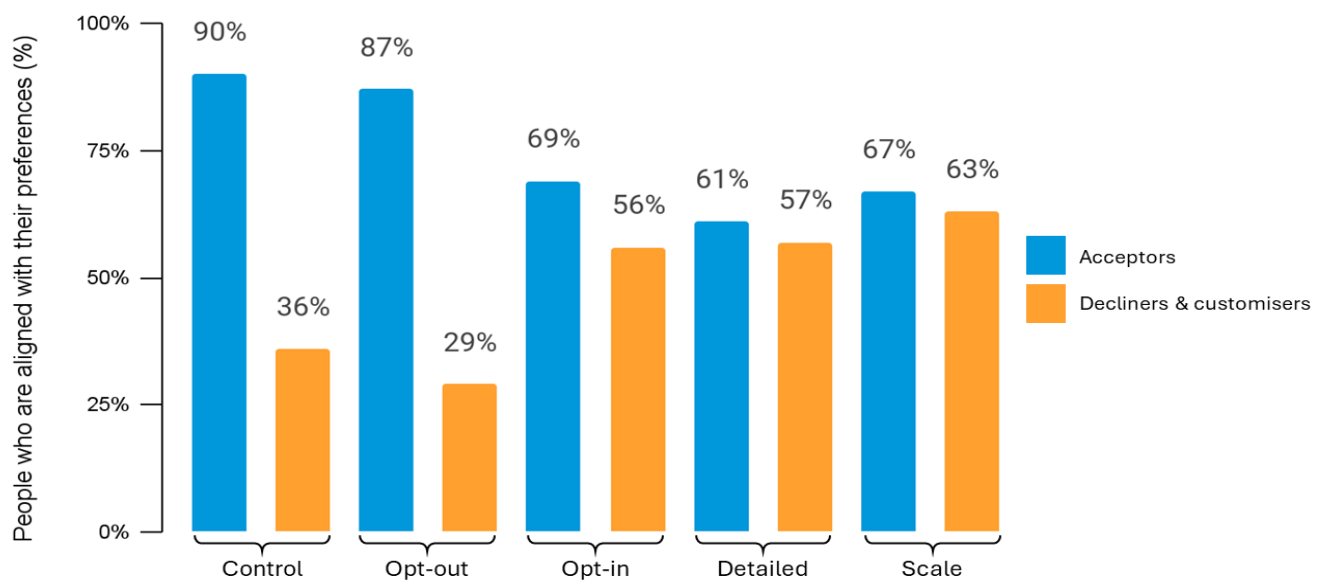
**Note:** Secondary analysis looking at rates of alignment (whether participants made a choice that reflects their preferences), using a logistic regression and controlling for gender, age, income, education, employment status, device (mobile vs computer), region, urban or rural location, ethnicity)<sup>11</sup>. The Benjamini Hochberg method is used to correct for multiple comparisons where the significance threshold of 0.05 was divided by the number of comparisons (i.e. 4) (N=5,019). None of the treatment arms are statistically different from the control.

While the above results may seem surprising at first glance, further analysis indicates potential explanations may be rooted in the way settings are designed and for whom they facilitate an aligned choice. In fact, further descriptive analysis reveals that those most likely to be aligned with their choice are those whose preference is to accept - consistent with our observation that participants tend to default to “Accept all”.

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<sup>11</sup> Regression analysis is used to test causation between people's alignment and the cookie settings they saw. Control variables are used to make sure that findings are not affected by observable confounders like age, income, education, or the device used. For ease of interpretation, the results are presented in the form of a bar graph, where bar heights represent what would have happened in the control group if it had seen the browser-based settings instead. If the 95% confidence interval overlaps the proportion of the control group (which it does here), this means that the new browser-based settings did not lead to a significant difference in the probability of being aligned with your choice compared to the control.

Figure 10: Differences in alignment between acceptors and decliners/customisers.



**Note:** Descriptive analysis where participants were considered aligned if they made a selection that reflects their stated preferences. To be aligned, decliners/customisers should have either declined or customised cookies when facing cookie management systems. Acceptors should have accepted all cookies to be aligned. (N=5,019)






When facing a neutral cookie setting system on each website, an overwhelming 9 out of 10 participants (90%) who should have accepted (the acceptors) did so, but only one third (36%) of those who should have declined or customised (the decliners / customisers) did so (See Figure 10 above). Similar results are observed for the “Opt-out” settings that presented acceptance as the default: an overwhelming majority of acceptors (87%) made a choice that reflects their stated preferences, while less than 3 in 10 (29%) of decliners/customisers did so. These findings highlight that settings encouraging acceptance and even neutral ones put acceptors at an advantage.

On the other hand, the “Opt-in”, “Detailed” and “Scale” settings made it easier to decline or customise for participants whose preference is to do so. The most aligned cookie settings manage to increase the proportion of decliners/customiser aligned with preferences by at least 20 percentage points (going from 36% in the control to 56% in “Opt-in”) and at most 30 percentage points (from 36% to 66% for “Scale”). Nevertheless, the fact that alignment rates for “decliners” or “customisers” are not higher on settings encouraging them to decline/customise, shows that the habit of accepting is well anchored, even when decline all is presented as the default option.

### **Finding 11: The cookie management designs which showed the highest rates of declining and customisation obtained the highest satisfaction rates**

When looking at satisfaction rates across treatment arms: the settings making it easiest to decline or customise (“Opt-in”, “Detailed”, and “Scale”) are the ones with higher rates of satisfaction (see Figure 11 below).

Figure 11: Satisfaction rate across each cookie setting option.

Are you satisfied with the choice you made?	Total					
		Control	Opt out	Opt in	Detailed	Scale
Yes	63%	60%	58%	64%	66%	66%
No, I would have liked to decline	10%	13%	13%	7%	8%	10%
No, I would have liked to accept	1%	1%	1%	2%	2%	2%
No, I would have liked to customise	12%	12%	14%	13%	10%	11%
I don't care	14%	14%	14%	14%	14%	11%

**Question:** Are you satisfied with the choice you made?

**Note:** Satisfaction rates for the whole sample (total) and by experimental arm (N=5,019). Green shading indicates the highest value and the values that are not statistically significant from it at the 95% confidence level on the horizontal line. This means that unshaded values are statistically significantly different from the highest value on that horizontal line. The total column is given for information, and is not to be included in the statistical comparison.

When asking participants who are dissatisfied what they would have liked to do, very few indicate that they would have liked to accept (between 1% and 2%), even on cookie settings where fewer participants who should have accepted did so. On the contrary, 14% said they did not care about cookies, a similar proportion (12%) said they would have liked to customise, and 10% said they would have liked to decline. These results further suggest that recommendations should encourage cookie settings that will put everyone on a level-playing field.

### Finding 12: Satisfaction rates are higher for data-protective choices

Looking at stated satisfaction rates<sup>12</sup> among those who did not make a choice that reflects their preferences allows us to better understand whether, by encouraging declining/customising, cookie settings create more dissatisfaction and/or frustration among acceptors, and vice versa.

We find that few decliners/customisers (35%) who ended up accepting all cookies (i.e. a more data disclosive choice) were satisfied with their choice. On the other hand, a majority of acceptors (73%) who ended up making a data-protective choice (declining/customising) are satisfied with their choice.

<sup>12</sup> Towards the end of the survey, participants were shown the choice they'd make when facing the cookie settings and were asked whether they were satisfied with their choice.








This suggests that designs that encourage participants towards more privacy-protective choices lead to higher satisfaction.

**Finding 13: Participants spend more time on browser-level cookie systems, but this will quickly be offset by the time saved from not interacting with them on every visited website.**

On a website-level neutral cookie setting, participants typically spend around 3 seconds<sup>13</sup> (see Appendix 1, Table 5), aligning closely with findings from other studies (see Utz et al, 2019). This means that visiting the three websites created for this experiment would have taken them around 9 seconds.

When participants face browser-level cookie settings, they spend on average 17 seconds. This may be attributed to a surprise effect, given the relative novelty of these settings. It may also suggest that when facing novel browser-level cookie settings, web users take more time to reflect on their choice. This “reflection” hypothesis is supported by the fact that web users refusing or customising spent more time on settings than those accepting across all cookie setting versions (see Figure 12).

Figure 12: Average time spent on each cookie settings version.

	 Control		 Opt-out		 Opt-in		 Detailed		 Scale	
Choice	accepted	decl/cust	accepted	decl/cust	accepted	decl/cust	accepted	decl/cust	accepted	decl/cust
Average time spent (sec)	3	3	13	20	14	17	15	21	17	24

**Note:** Average time spent on a cookie system by choice made and across experimental arms (N=5,019). Time spent was winsorised at the top 1% to get rid of outliers, most likely reflecting participants going away from their computer/ device. Green shading indicates the statistically highest value at the 95% confidence level within each experimental arm.

Even if web users spend a significantly longer time on browser-level cookie settings, this investment proves reasonable, as the time spent is likely to be offset after only a few visits.

**Participants’ understanding and opinion of the cookie setting options**

Whether participants make a cookie choice consistent with their preferences also depends on their understanding of how web cookies work and their opinion of the cookie settings page (such as ease of navigating, feeling of satisfaction with the interface and the information provided).






<sup>13</sup> Other studies might report different times, but this may be due to the way they define “time spent”. For example, whether it includes loading time or not will affect results. The important thing here is to observe the differences between cookie settings.

### Finding 14: Only a minority of participants correctly understood whether they had set cookie preferences at the browser or the website levels

All participants were asked whether the cookie settings they interacted with were relevant just for the website they popped up on (correct for the “Control” group) or for the browser as a whole (correct for all treatment groups). Across the treatment arms, only about 40% participants correctly recognised that the cookie settings are relevant for the browser despite being shown text on the pop-up explaining the settings would apply to all websites. Even fewer participants (35%) in the “Control” group identified the level of the pop-up correctly, despite it being a more familiar scenario (see Figure 13).

These findings show that while browser-level cookie settings are likely a new concept for many participants, they are equally (if not more) likely to understand its application compared to participants in the status quo group when they are informed of this at the point of setting their preferences. Another reason for this could be that the novelty of the created cookie management systems caused some participants to pause and take time to read the text, or similarly that being part of a study makes participants more aware and likely to pay attention to things. This gave them the chance to realise that they let you set cookies at a browser-level rather than on a website-by-website basis.

Figure 13: Understanding of whether the cookie settings were on a website or browser level.

% who understood correctly the level of the pop-up they saw	 Control	 Opt in	 Opt out	 Detailed	 Scale
	Correct	35%	40%	40%	37%

**Question:** Do you think the cookie pop-up that you saw in this experiment is relevant...[only for the website it popped up on/ for all websites opened on this browser / for the same types of websites (e.g., only banking websites / I don't know) (N=5,019)

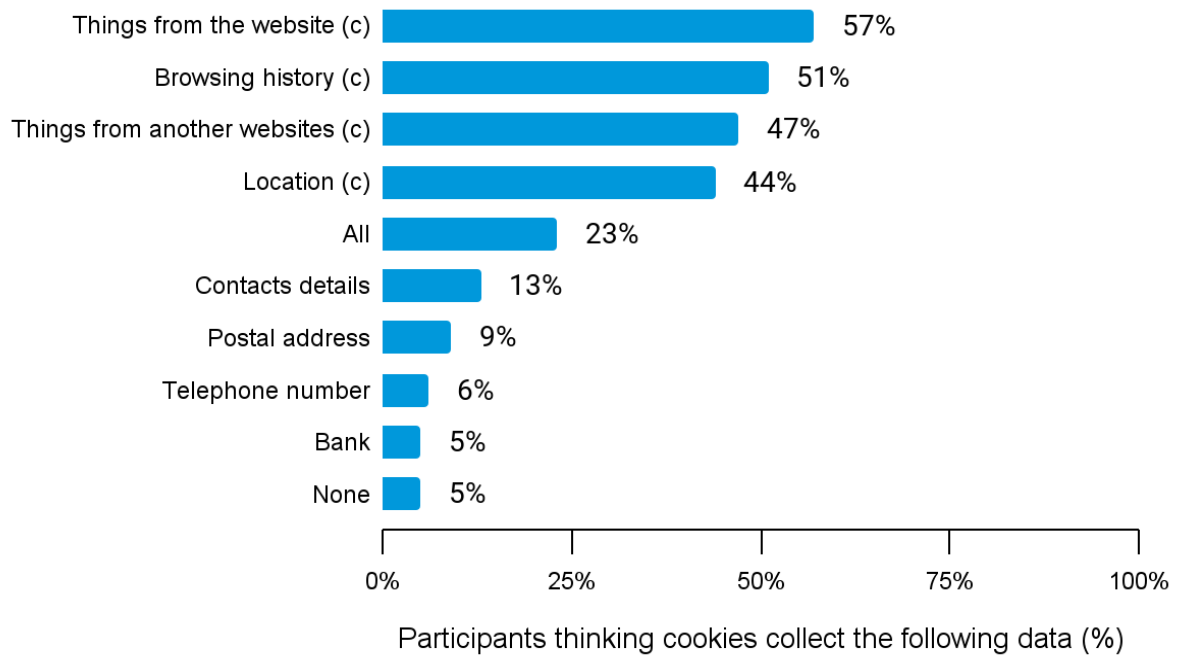
**Note:** Red shading indicates that this value is significantly lower than the highest one in the line at the 95% confidence level.

There is room for improvement in providing clearer and more explicit information regarding the nature of the browser cookie management systems. The participants in the browser-based experiments were informed about the different level at which cookies would apply, and while it is encouraging that there is a better understanding of how browser-based cookies function compared to website-based cookie pop-ups, the comprehension levels are still fairly low. If browser cookie setup is implemented, it could be useful to have a campaign educating participants on the new level of cookie settings and reminding them of the purpose and use of cookies. This would give a chance to the participants who might not read the entire cookie page to still learn about how to navigate the browser-based cookies to match their preferences.

### Finding 15: Participants demonstrate widespread misconceptions about cookies

Looking at participants' comprehension, we again see only small differences across all groups in their understanding of the data cookies collect. Only about 20% of participants across the sample correctly identified which data is, and is not, collected by cookies (see Appendix 1, Table 6).

Figure 14: Understanding of data collected by cookies. Correct responses are marked with '(c)'.



**Question:** To the best of your knowledge, which of the following information could be collected if you selected “accept all” cookies? (N=5,019)

More than half of participants selected that they thought cookies collect “Things I looked at on the website” and “Browsing history” and slightly less than half selected “Things I looked at on other websites” and “Location”. However, there were also some misconceptions as an additional 23% of participants incorrectly thought that cookies collect all the listed data – including contacts details, address, phone number, and bank information (see Figure 8 above).<sup>14</sup>






Overall, these relatively low levels of understanding and misconceptions further suggest that education about what cookies do could be useful to encourage people to think about their choices.

<sup>14</sup> Please note that to calculate the total proportion of participants, we need to combine the 23% who selected ‘All’ with the response for each individual data type, e.g. the percentage of people who think cookies collect browsing history is 51% + 23%.

## Finding 16: Opinions on the cookie settings pages is mostly positive with no one version standing out particularly

Participants' opinions of cookie management systems are fairly similar across all groups with between 49-62% agreeing with the statement (see Figure 15).

Figure 15: Opinion towards the cookie setting options.

	 Control	 Opt in	 Opt out	 Detailed	 Scale
Making a selection regarding cookies is simple	61%	62%	59%	59%	58%
The information is easy to understand	60%	62%	59%	59%	60%
The choices are presented to me with my interests in mind	49%	54%	49%	51%	52%
The pop-up allows me to easily control the level of data protection	55%	61%	60%	61%	59%

**Question:** Looking at the cookie pop-up again, to what extent do you agree with the following statements? (N=5,019)

**Note:** Green shading indicates the statistically highest value, and the values that are not statistically significantly different from it at the 95% confidence level per row.

Participants in all treatment groups are slightly more likely to agree that the cookie settings pages let them easily control the level of data protection compared to the “Control” group. This might be due to the design of the treatment set up that allows them to customise the cookies choice on the first page, unlike on the “Control” pop-up that presents frictions by requiring more clicks to do so. Reducing friction can not only make it easier to complete an action (in this case, customising), it can also decrease frustration. Participants who saw the versions that make it easiest to decline or customise (“Opt-in”, “Detailed”, and “Scale”) were more likely to agree that “the choices are presented to me with my interests in mind” than participants in the groups encouraging acceptance (“Control” and “Opt-out”). This might have also led to higher levels of satisfaction with their cookie choice, as indicated earlier.

When we look into the differences across devices used to complete the survey, we see that computer participants agreed more strongly with all opinion statements than participants on mobile devices (see Appendix 1, Table 7). We know from research that reading comprehension is lower when using mobile phones compared to computers because we see less text which increases the need to rely on our memory for context (Singh et al, 2011). Therefore, it is not surprising that participants on computers felt like the information was easier to understand and making a choice was simpler than the mobile participants did. It is important to keep cookie settings on mobile devices short and ideally ensure they fit on the screen with minimal scrolling involved by, for example, utilising expanding and hiding additional information<sup>15</sup>. Further research should explore specific versions for mobile and/or tablet devices to optimise understanding of the implications of cookie choices.

<sup>15</sup> Although buttons positioning changed when going from laptop to mobile, the amount of text did not.

## Participants' attitude towards browser-based cookie settings

In this section, we will look into participants' attitudes towards browser-based cookies more generally to identify additional features that seem important to users. We also explore their opinion of how often it is appropriate to update cookie settings.

### Finding 17: Participants were split on attitudes towards browser-level cookie settings.

Participants were split on the usefulness of setting cookies through their browser. A little over half of all participants (55%) would like to set up their cookies once for all websites, while 45% would like to see it on each website they visit (see Appendix 1, Table 8). They mentioned in the open-ended question asking about ideas for browser-based cookies that they appreciate the convenience and the time this could save: *"Having a browser level setting would be better as I wouldn't annoy me and I could make informed decisions."*, *"I like the idea as it makes browsing easier and more convenient."*

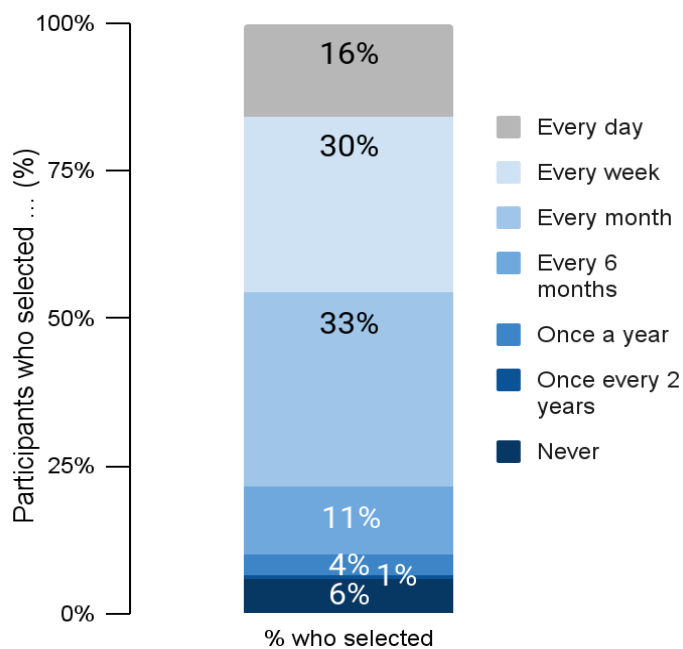
A similar proportion (54%) of participants would like to be able to set up different cookie settings for different types of websites in the event of cookie settings being at the browser-level. This desire for flexibility also came through in the open-ended question about ideas: *"It is good to have flexibility because there are some websites that I just don't trust."*, *"I'd rather set cookies individually for each website - some of the information I give to my bank or my online shopping website is not information I want to give to anyone else."*

These mixed opinions are consistent with the finding from this report (and others, see DMA, 2022) that participants feel similarly about browser-based cookies and the current website-based system.

When asked which features they would like to see on a browser-based cookie management system, participants were most supportive (71%) of the idea of being able to change their browser cookie settings at any time (see Appendix 1, Table 9). This was particularly true for participants aged 55 and over who are also the ones least comfortable with sharing their data. It is therefore not surprising to see them liking features that give them a higher sense of control. The fact that nearly 80% of participants would like a reminder to update their cookie settings at least monthly should browser-based cookie management systems replace website level settings, further highlights the importance of allowing participants to revisit their decision about their browser cookie settings (see Figure 9).

Finally, nearly half of participants (48%) would also appreciate being able to block cookies for a website by entering the URL directly. This once again supports the idea that people appreciate retaining some level of control over their data sharing settings.

Figure 16: Desired frequency of prompts to update cookie settings.



**Question:** If cookies were managed at a browser level, how often would you like to be prompted to update your browser-level cookie settings? (N=5,019)

Despite the fact that browser-based cookie systems allow web users to save time, they are still ambivalent towards them as many prefer to retain control over their data sharing preferences across websites. Features that could solve this problem and that were favoured by the participants of this experiment were: the ability to adapt cookie preferences by website type, and the ability to change settings at any time and to be reminded at least once a month about it.

## Conclusions

People remain divided over the idea of browser-based cookies. To improve sentiment, any future browser-based cookie settings should include features that will enhance web users' feelings of control over their data (e.g. frequent prompts for updates, options to adapt preferences by types of websites, or for specific websites).

Participant engagement and satisfaction improved when they had access to more functionality details, an interactive interface to select their preferences, and timely prompting about privacy. As a result, should browser based cookie management systems replace the website level settings, we recommend that browser-based cookie setting design should attempt to disrupt users' habits of automatically accepting through novel designs to create a dissonance with what they are used to seeing. Furthermore, any cookie settings that encourage participants to make a privacy-protective choice will lead to higher satisfaction regardless of initial preferences.

# Appendices

## Appendix 1: Tables

Note: An asterisk next to a number indicates the statistically highest value, and the values that are not statistically significantly different from it at the 95% confidence level per row and characteristics (e.g. age)

Table 1: Comfort with sharing data on what you do online with websites

Are you comfortable with sharing data on what you do online with websites? (e.g., browsing history, services and products purchased, etc.)	Total (5,019)	Age			Gender		Income			
		18-24 (688)	25-54 (2,948)	55+ (1,383)	M (2,369)	F (2,638)	<20k (1,149)	20-39.9k (1,593)	40-59.9k (1,224)	60k+ (1,053)
Yes	51%	58%*	56%*	44%	54%	52%	49%	53%	53%	58%*

Table 2: Demographics for participants classified into the decliners/customisers persona

Persona	Total (5,019)	Age			Gender		Income			
		18-24 (688)	25-54 (2,948)	55+ (1,383)	M (2,369)	F (2,638)	<20k (1,149)	20-39.9k (1,593)	40-59.9k (1,224)	60k+ (1,053)
Expected to decline/customise	47%	42%	44%	56%*	46%	48%	51%*	47%	47%	42%

Table 3: Choice made on the cookie pop-up by treatment and per device used

Choice made (5,019)	Control		Opt-in		Opt-out		Detailed		Scale	
	Computer (531)	Mobile (494)	Computer (496)	Mobile (499)	Computer (509)	Mobile (478)	Computer (482)	Mobile (424)	Computer (482)	Mobile (524)
Decline/ customise	30%*	14%	50%*	28%	21%*	12%	48%*	31%	42%*	24%

Table 4: Reasons for accepting the cookie pop-up (participants could select more than one response).

Why did you accept?	Total (3,191)	Why did you decline?	Total (1,534)	Why did you customise	Total (240)
Clicked out of habit	44%	Clicked out of habit	22%	Clicked out of habit	18%
It was the fastest option	30%	It was the fastest option	8%	It was easy to do so	29%
To make sure the website works	27%	I don't want to share my data	58%	To choose what data I share	64%
Don't mind sharing my data	16%	To avoid being tracked	45%	Clicked randomly	7%
To get personalised adverts and content	14%	I don't care about seeing relevant adverts	34%		
Clicked randomly	8%	I don't want to see personalised adverts and content	38%		
		Clicked randomly	4%		



Table 5: Average time in seconds participants spent viewing the cookie settings

Average pop-up viewing time (5,019)	Control (1,025)	Opt-in (995)	Opt-out (987)	Detailed (1,006)	Scale (1,006)
Time spent on cookie settings (sec)	3	15	15	18	20*

Table 6: Understanding of whether cookies collect each data type by treatment arm

- *Note: The correct answers to the question are marked with a “(c)”*

What data cookies collect? (5,019)	Total (5,019)	Control (1,025)	Opt-in (995)	Opt-out (987)	Detailed (1,006)	Scale (1,006)
Selected all correct answers	19%	20%	17%	19%	17%	20%
Things I looked at on the website (c)	57%	62%*	56%	56%	54%	55%
Browsing history (c)	51%	54%	51%	50%	50%	51%
Things I looks at on other websites (c)	47%	46%	46%	47%	47%	47%
Location (c)	44%	47%*	43%*	41%	42%	44%*
Selected all answers	23%	19%	24%*	25%*	24%*	26%*

Contact details	13%	12%	15%*	13%*	16%*	13%*
Postal address	9%	7%	9%*	9%*	9%*	10%*
Telephone number	6%	6%	6%	6%	7%	7%
Bank	5%	5%	5%	5%	6%	6%
None	5%	4%	6%	5%	5%	5%

Table 7: Participants' opinion about the different cookie management systems by device on which the survey was completed

Opinion about the cookie settings (% who very much/ moderately agree with each statement) (5,019)	Device		
	Total (5,019)	Computer (2,501)	Mobile (2,518)
Making a selection regarding cookies is simple	60%	66%*	53%
The information is easy to understand	60%	66%*	53%
The choices are presented to me with my interests in mind	51%	53%*	48%
The banner allows me to easily control the level of data protection	59%	65%*	53%

Table 8: Attitude towards browser-level cookie management system

% who would like each option	Total (5,019)
Set my cookie preferences once for all websites	55%
Set my cookie preferences each time I visit a new website	45%

Table 9: Attitude towards specific features of browser-level cookie settings

% who would like each functionality	Total (5,019)
Be able to have different settings for different types of websites (for example: accept all cookies for banking websites, but decline all cookies for online shopping ones)	54%
Be able to block cookies for some specific websites by entering their web address (URL) directly	48%
Be able to change the cookie settings at any time if I change my mind	71%
None of them, I prefer to set my cookie settings on each website I visit	7%

## Appendix 2: Details of each experiment “arm”

Figure 1: the initial screen for the “Control” arm, reflecting current best practice for website-based cookie selection

**We use cookies**

We use cookies on our website to collect information about how you interact with our website. Some of these cookies are essential so that our website can function ('necessary'). Some cookies provide us with additional information which we use for the following purpose:

- 1. Functional:** To allow certain functions of the websites that improves navigation (remember your login details, region, language, etc.)
- 2. Performance:** To collect website analytics on how you have interacted with our site (e.g. track most popular pages or counting errors) in order to improve it.
- 3. Advertisement:** To collect data on your browsing history data in order to show you personalised promotions and contents. If you do not give your consent, you will still see ads from us and our partner sites, but we will not personalise them or use cookies to provide them.

[Accept All](#) [Decline All](#)

[Customise Your Cookie Settings](#)

Figure 2: the customisation screen for the “Control” arm

**Customise your cookie settings**

We use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience.

- Necessary**  
They are required to enable basic site features like providing secure log-in or adjusting consent preferences. No personally identifiable data is stored.
- Functional**  
They help perform certain functions like remembering log-in details, preferred language and currency, or collecting feedback, and other third-party features.
- Performance**  
They are used to understand how visitors interact with the website, offering insights into visitors metrics like numbers, bounce rate, and traffic source.
- Advertisement**  
They are used to customise advertisements based on the pages you visited previously and to evaluate ad campaigns' performance.

[Accept All](#) [Save My Preference](#) [Decline All](#)

Figure 3: the screen for the “Opt-in” arm, reflecting the scenario that most incentivises declining all options.

**Customise your browser cookie settings once.  
This will be saved for all websites**

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

- Necessary**  
They are required to enable basic site features like providing secure log-in or adjusting consent preferences. No personally identifiable data is stored.
- Functional**  
They help perform certain functions like remembering log-in details, preferred language and currency, or collecting feedback, and other third-party features.
- Performance**  
They are used to understand how visitors interact with the website, offering insights into visitor metrics like numbers, bounce rate, and traffic source.
- Advertisement**  
They are used to customise advertisements based on the pages you visited previously and to evaluate ad campaigns' performance.

[Accept All](#) [Save My Preference](#) [Decline All](#)

Figure 4: the screen for the “Opt-out” arm, reflecting the scenario that most incentivises accepting all options.

**Customise your browser cookie settings once.  
This will be saved for all websites**

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

- Necessary**  
They are required to enable basic site features like providing secure log-in or adjusting consent preferences. No personally identifiable data is stored.
- Functional**  
They help perform certain functions like remembering log-in details, preferred language and currency, or collecting feedback, and other third-party features.
- Performance**  
They are used to understand how visitors interact with the website, offering insights into visitor metrics like numbers, bounce rate, and traffic source.
- Advertisement**  
They are used to customise advertisements based on the pages you visited previously and to evaluate ad campaigns' performance.

[Accept All](#) [Save My Preference](#) [Decline All](#)

Figure 5: the screen for the “Detailed” arm, reflecting the idea that more information will secure stronger engagement from users.

**Customise your browser cookie settings once. This will be saved for all websites**

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

- Necessary**  
They are required to enable the basic features of this site, such as providing secure log-in or adjusting your consent preferences. These cookies do not store any personally identifiable data.
- Functional**
  - Remember my login details
  - Remember my website preferences (e.g., language, currency)
  - Show media content present on the websites (e.g. videos)
- Performance**
  - Count how many visitors there are on the website
  - Record how I interact with the website (pages visited, time spent)
- Advertisement**
  - Collect information based on my web browsing activities, for example, to personalise adverts
  - Share the information collected with other partnered organisations, for example, to measure the effectiveness of adverts

[Accept All](#) [Save My Preference](#) [Decline All](#)

Figure 6: the screen for the “Scale” arm, reflecting the idea that a more interactive interface will secure stronger engagement from users.

**Customise your browser cookie settings once. This will be saved for all websites**

Cookies collect information about how you interact with websites. Websites use cookies to enhance navigation and perform certain functions. You can enable or disable some or all of them, but it may affect your browsing experience on some websites. **Please note that the selection you make is saved for all websites.**

Let us know how you feel about sharing your information with websites and we'll let you know which cookies you should accept or decline.

I would rather **not share my data** and not have a personalised experience.

I would rather **share my data** and have a personalised experience.

[See more details](#) ▾

[Accept All](#) [Save My Preference](#) [Decline All](#)

## Appendix 3: The decoy task

### Instructions that participants saw

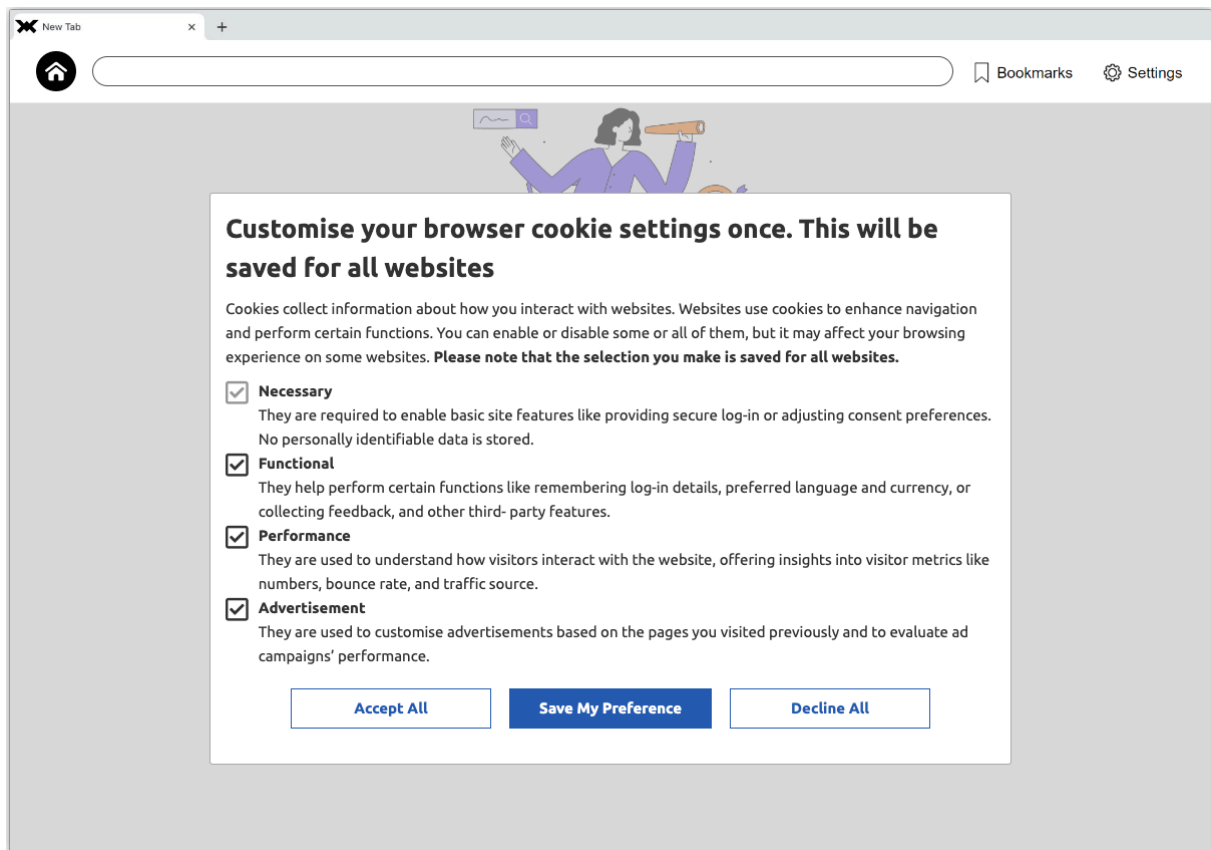
**Instructions:** The creators of this web browser are interested in improving its homepage features and the user experience on its partnered websites that it chooses to feature. When you click on the button below, their current homepage will open and you will see what any new browser user would see.

**Task:** Please visit each of the three websites listed on the browser homepage and follow the instructions in the blue banner at the top. We will ask you questions about what you saw on the websites afterwards.

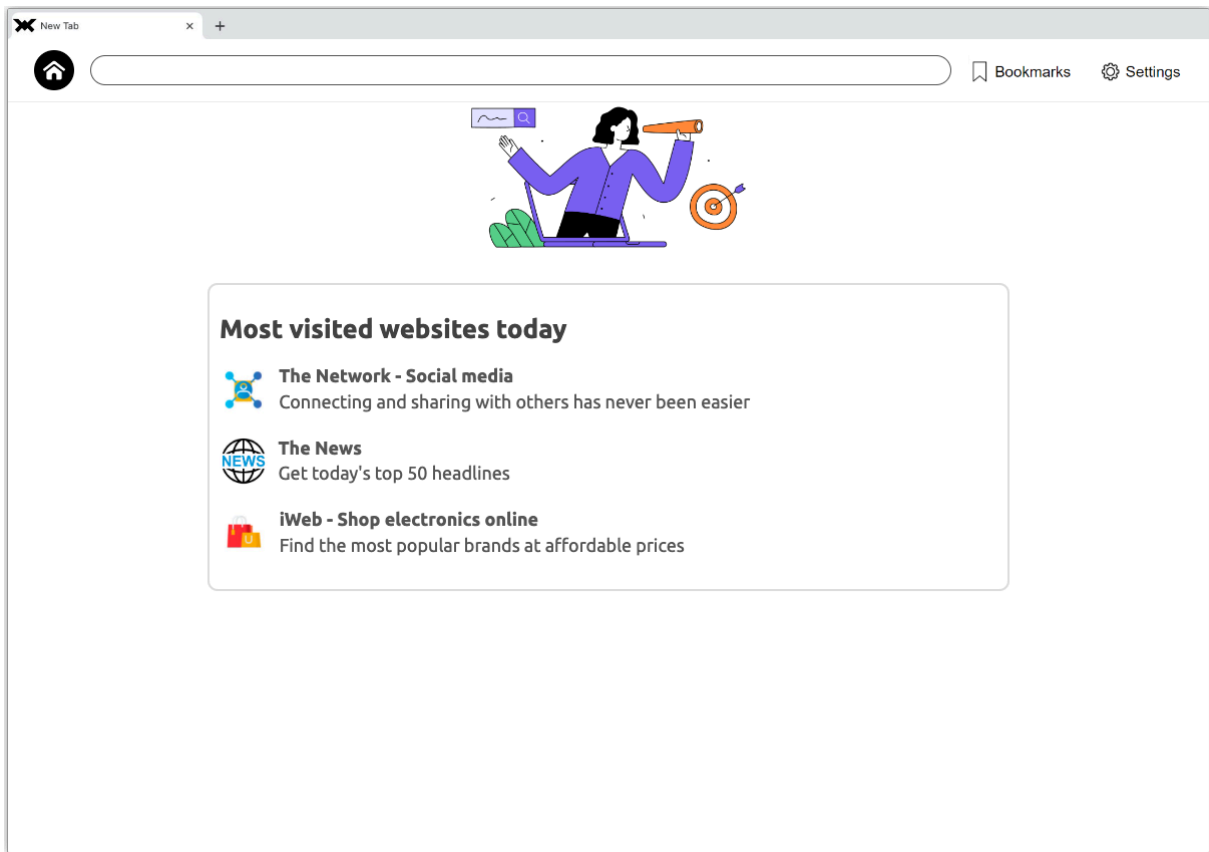
Click *Open Browser* to access the web browser in a pop-up window.

Open Browser

### Example of screen they see when opening the browser.

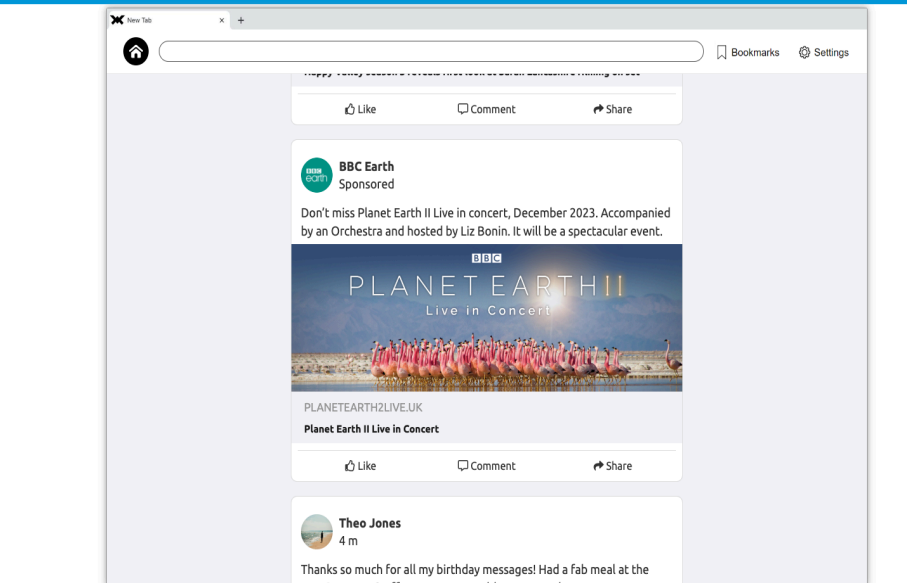


### Browser home page



*Example of screen they see when opening one of the websites (the Network - Social media) with instructions to look for specific informations (decoy)*

Please find and read the Planet Earth II post.  
Once you're done, click the home button (house) just below to go back to the browser homepage.





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