



# Active Online Choices: Designing to Empower Users

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Final report by the Behavioural Insights Team for the Centre for  
Data Ethics and Innovation, August 2021



**doteveryone**

Centre for  
**Data Ethics  
and Innovation**

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# 1. Executive summary

Digital products and services are integral to modern life, but awareness of how they operate is low, and they are not always designed to easily allow us to use them in ways that align with our individual values or needs.<sup>1</sup> This can range from controlling what data services collect about us, to the kinds of content shown in our social media feeds and advertising we receive.

**Designing services that enable people to use them in line with their preferences is an important part of creating a positive technology landscape, and this is gaining recognition among policymakers, regulators and industry.** The Behavioural Insights Team (BIT) partnered with the Centre for Data Ethics and Innovation (CDEI) and Doteveryone<sup>2</sup> to explore how to create 'active' choices for online users. We defined active choices as choices that reflect users' wishes without obstruction, and are based on an understanding of the likely consequences. This work builds on the [CDEI's review of online targeting](#), which included recommendations to government, regulators and industry, regarding how data is used to shape the online experience.<sup>3</sup>

The aim of this project was to explore and demonstrate how to create active choices; choices where individual users are empowered to better control how they use digital products and services, clear in the understanding of the consequences.

## 1.1 Overview of research

**We conducted desk research and workshops to develop prototypes that demonstrate what active choice could look like in three online contexts - smartphone, web browser and social media. These included:**

- A 'slider mode', allowing manual customisation along a spectrum. The slider signals to the user the options and that these sit on a range.
- A four-box grid design to customise personal priorities for browser experience.
- A 'private mode', bundling choices together into a simple binary.

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<sup>1</sup> Most adult internet users were not aware of all the ways in which companies can collect their personal data online.

Ofcom (2021). [Adult's Media Use and Attitudes Report 2020/21](#)

<sup>2</sup> In May 2020, during the course of this project Doteveryone announced that they would be ending their work. We continued working with two key members of Doteveryone as the project's external consultants.

<sup>3</sup> CDEI (2020). [CDEI Review of online targeting](#).

**We then ran three Randomised Controlled Trials (RCTs), each with c. 2,000 participants. These tested the participants' ability to make informed choices about their privacy and personalisation settings using the new designs against a control.**<sup>4</sup>

The control and alternative designs were compared using the following measurements:

- Task accuracy - could participants adjust settings to match the preferences of a fictional persona?
- Understanding of consequences - could participants correctly indicate the implications of their choices?
- Feelings of control - asking if people felt in control through a survey question.

## 1.2 Key findings

**This project did not seek to develop specific designs that could be implemented by industry, but instead set out to illustrate what is possible and to generate ideas that inspire and provoke change through proof-of-concept.**

Although an online experiment cannot fully replicate the experience of using technologies in everyday life, **there were some encouraging findings that point to the benefits of active choice design:**

1. In both the smartphone and web browser experiments, some of the prototype designs outperformed the control designs across all three measures.
2. In these two experiments, simplifying and bundling privacy settings better enabled users to adjust settings to match the preferences of a fictional persona, on average. Their understanding of consequences also improved and their feelings of control either improved or did not change.
3. There was no 'one size fits all' solution. No single design significantly outperformed all of the others across the three main outcomes. The performance of designs also varied by persona chosen.

The experiments also generated useful learnings for further work of this kind to build from:

1. Self-report metrics such as feelings of control are not a good indicator of the ability of people to make choices in line with preferences.  
**Evidence:** In our social media experiment, self-reported feelings of control improved even though task accuracy and understanding of consequences did not.
2. Designs need to be carefully tailored to users' levels of knowledge.

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<sup>4</sup> We chose a number of common existing interfaces as a baseline. The purpose of this was to have a realistic control. We then simplified and modified the control interfaces to allow for fairer comparison with our designs. Our mock-up designs were not endorsed by any organisations.

**Evidence:** Feedback suggests the designs used for the social media prototype were too complex. This may have contributed to the alternative designs not outperforming the control on task accuracy and understanding of consequences in the social media experiment.

3. New concepts require careful development, explanation and implementation.

**Evidence:** The performance of the trusted third party prototype where participants could ‘delegate choice’ to a third party organisation appeared to be driven by familiarity and association of that organisation with the digital world.

4. In designing for active choice, clear labelling of options, transparency and testing are crucial to ensure that simplification and bundles do not disadvantage any user groups and that people are able to fully align choices with their preferences.

**Evidence:** In the smartphone experiment, some of the alternative designs performed no better than the control or even worse than the control on task accuracy among participants who chose the ‘most concerned’ fictional persona.

## 1.3 Implications

It is encouraging that a number of policy initiatives, including the Draft Online Safety Bill<sup>5</sup>, the the Information Commissioner’s Office’s Age Appropriate Design Code<sup>6</sup> and the establishment of the Digital Markets Unit<sup>7</sup>, have recognised the central role that empowering users through active choice can play as part of a broader approach to digital regulation. We consider the implications of our work for policymakers, regulators and industry, and encourage them to build on our findings.

### Implications for policymakers and regulators

- Consent is not enough. Regulatory outcomes that focus only on users consenting to how their data is used creates incentives for organisations to use techniques to obtain that consent most efficiently. However, obtaining consent is not necessarily a marker that the user has made choices in line with their preferences and understood the consequences. Therefore these frameworks should have active choice at their centre. Regulatory frameworks for online interactions should incorporate active choice requirements where appropriate.
- The Digital Regulation Cooperation Forum should work with technology companies to develop best practices on ways to combine or bundle choices to reduce the complexity for users.

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<sup>5</sup> DCMS (2021). [Draft Online Safety Bill](#)

<sup>6</sup> Information Commissioner’s Office (2020). [Age appropriate design: a code of practice for online services](#).

<sup>7</sup> Competition and Markets Authority (2021). [Digital Markets Unit](#)

- The Digital Regulation Cooperation Forum should conduct further research into delegating choices to trusted third parties and consult with leading consumer protection and civil society organisations to develop applications of this approach.

**Implications for industry, including digital companies and independent developers**

- Companies should apply the same level of service optimisation for active choice in settings as they do to other parts of their platform design and publish their development and findings.
- Companies should further develop and deploy the approach of bundled choices and seek a balance between providing information while not overwhelming users.
- Companies should dedicate significant resources to the development of active choice as part of their platform development and design.

## 2. Project background and overview

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Interactions with the digital world are an integral, and for the most part, unavoidable, feature of our everyday lives. According to Ofcom, only 6% of households in the UK do not have access to the internet, and the majority of people feel that the internet has improved their lives.<sup>8</sup> However, while understanding of the digital world has grown, many people are unable to shape their online experiences in line with their personal preferences.<sup>9</sup>

Around 80% of users are willing to accept companies collecting and using their personal data with some reassurances and/or in exchange for some benefits.<sup>10</sup> Nonetheless, the majority of people, even those who might consider themselves data-savvy, are unaware of the scale and sophistication of the ways in which their personal data can be collected and used online. Further, the way people understand and assess their privacy options is influenced by factors such as the way that online companies present information to them.<sup>11</sup>

The pernicious lack of agency over the digital infrastructure that features so prominently in our lives has fostered distrust — only 19% of people believe technology companies are designing their products “with my best interests in mind”.<sup>12</sup>

We know that there is a strong appetite for responsible practice within the UK industry: 80% of tech workers believe companies have a responsibility to ensure their technologies don't have negative consequences for people and society, and 63% would like more opportunities to assess the potential impacts of their products.<sup>13</sup> Our work also coincided with announcements by various prominent technology firms to consider user design in how people make decisions about their privacy and data. For example, Apple announced the introduction of opt-in data consents for apps in iOS14<sup>14</sup> and Google has launched features to improve the interface for safety and privacy controls, including privacy Dashboard, as part of Android 12.<sup>15</sup> Facebook published a white paper focused on working with regulators, governments and civil society to improve communication of privacy information, stating that people have to be “meaningfully informed, in a way that empowers them to make choices about how they participate online and share their data” and committed to a “continued expansion of privacy tools and controls”.<sup>16</sup> Facebook also introduced new tools to make it easier for users to control what they see in their News Feed.<sup>17</sup>

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<sup>8</sup> Ofcom (2021). [Adults' Media Use and Attitudes report](#)

<sup>9</sup> Doteveryone (2020). [People, Power and Technology: The 2020 Digital Attitudes Report](#).

<sup>10</sup> Ofcom (2021). [Adults' Media Use and Attitudes report](#)

<sup>11</sup> Competition and Markets Authority (2020). [Online platforms and digital advertising market study final report](#)

<sup>12</sup> Doteveryone (2020). [People, Power and Technology: The 2020 Digital Attitudes Report](#).

<sup>13</sup> Doteveryone (2019). [People, Power and Technology: The Tech Workers' View](#).

<sup>14</sup> Apple (2021). [AppTrackingTransparency requirement update](#)

<sup>15</sup> Google (2021). [More ways we're making every day safer with Google](#)

<sup>16</sup> Facebook (2021). [Our Privacy Progress and the Path Ahead](#)

<sup>17</sup> Facebook (2021). [More Control and Context in News Feed](#)

## Project aims and research activities

This project was commissioned by the Centre for Data Ethics and Innovation (CDEI), which was created in 2018 by the UK government to investigate and advise on how to maximise the benefits of data-driven technologies and foster trustworthy innovation. One of its workstreams explores the use of data in shaping people's online experiences. In February 2020, the CDEI published a review of online targeting, which included a number of recommendations to government, regulators and industry, regarding how data is used to shape the online experience.<sup>18</sup>

To move the recommendations forward, the CDEI undertook further work with BIT, with the aim of:

- Identifying ways to design online choice environments that empower people to set user controls in ways that align with their preferences.
- Providing firms operating online with an evidence-base for the design of user-friendly choice environments.

We also intend for this work to contribute to ongoing policy and regulation developments, including the Draft Online Safety Bill,<sup>19</sup> the Information Commissioner's Office's Age Appropriate Design Code<sup>20</sup> and the establishment of the Digital Markets Unit<sup>21</sup>.

This project did not seek to match the level of design and user experience that technology companies would create with the talent, time and resources available to them. Instead, our intention was to illustrate what is possible and to generate ideas that will inspire and provoke change.

In this project, we undertook the following research activities:

1. Conducted desk research, first-hand website audits and expert interviews with people working in the tech industry. These helped us to identify the existing barriers to achieving an empowering online environment that involves more active choices.
2. Prioritised areas for improvement by selecting three common user contexts: a smartphone; a web browser and a social media platform. We also selected common types of user preferences for each of these contexts (see Table 1).
3. Drawing on behavioural science principles identified in our literature review, we created interface prototypes for each context in a way that we expected to promote active choices and understanding of the consequences.

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<sup>18</sup> CDEI (2020). [Online targeting: Final report and recommendations](#)

<sup>19</sup> DCMS (2021). [Draft Online Safety Bill](#)

<sup>20</sup> Information Commissioner's Office (2020). [Age appropriate design: a code of practice for online services](#).

<sup>21</sup> Competition and Markets Authority (2021). [Digital Markets Unit](#)



4. User-tested the prototypes with 12 participants to understand how people engaged with the choices, what barriers they faced when trying to make a choice and to identify how to improve the designs. The prototypes were modified based on the observations and feedback collected during these sessions.
5. Ran three online experiments to test how our alternative interfaces performed against a control.<sup>22</sup>

Table 1: User contexts used to frame development of prototypes

Context	Common types of preferences
1. Smartphone operating system	<ul style="list-style-type: none"> <li>• Overarching privacy settings, e.g. giving apps access to location data, camera and microphone</li> <li>• Private browsing mode</li> <li>• Sharing phone usage data for ad personalisation</li> <li>• Frequency of notifications</li> </ul>
2. Web browser settings	<ul style="list-style-type: none"> <li>• The information the user shares with the browser and the websites they visit</li> <li>• Blocking particular types of website or content</li> </ul>
3. Social media settings	<ul style="list-style-type: none"> <li>• Organising feed content (e.g. chronologically or algorithmically)</li> <li>• Filtering of untrustworthy sources and/or fake news</li> <li>• Sharing settings to determine who sees content you post</li> </ul>

We have published interim reports covering a summary of the desk research<sup>23</sup>, findings on barriers to active choices and early prototype design work<sup>24</sup> and results from the first experiment (Trial 1: Smartphone)<sup>25</sup>. In that research we found several barriers to early stages of engagement with choices, including:

- High prevalence of defaults in the businesses' interest
- Challenges in finding the right place to make choices
- One-off engagement at sign-up and poor timing of prompts

We also found barriers to deeper engagement with online choices, including:

- Lack of explanation of the business purpose of data collection and personalisation
- The flow of user data is rarely visible to the user
- Privacy settings and information is focused on what is shared with other users rather than with the platform or third parties
- The trade-offs inherent in these data choices are poorly explained

<sup>22</sup> We chose a number of common existing interfaces as a baseline. The purpose of this was to have a realistic control. We then simplified and modified the control interfaces to allow for fairer comparison with our designs. Our mock-up designs were not endorsed by any organisations.

<sup>23</sup> BIT (2020). [Active Online Choices: Designing to Empower Users. Summary of desk research](#)

<sup>24</sup> BIT (2020). [Active Online Choices: Designing to Empower Users. Update report by the Behavioural Insights Team and Doteveryone for the Centre for Data Ethics and Innovation](#)

<sup>25</sup> CDEI (2021). [Active choices: Interim findings](#)

In this report we cover the set-up of the three online experiments, the main results and their implications. Further details on the trial methodology and findings are published separately in an accompanying Technical Report.<sup>26</sup>

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<sup>26</sup> BIT (2021). Active Online Choices: Designing to Empower Users. Technical Report

## 3. Online experiments set-up

### 3.1 Trial designs

We ran three online Randomised Control Trials (RCTs) on Predictiv, BIT's online experimentation platform, to test whether different interfaces and choice bundles improve the ability of users to make informed choices about their privacy and personalisation settings. Table 2 lists the trial designs for each of the three experiments and Examples 1-3 below show excerpts of the final interfaces.<sup>27</sup>

Table 2: List of trial designs

Experiment	Trial designs (designs tested)
1. Smartphone	<ul style="list-style-type: none"> <li>• Control</li> <li>• 1A: Slider</li> <li>• 1B: Private mode</li> <li>• 1C: Trusted third party</li> </ul>
2. Web browser	<ul style="list-style-type: none"> <li>• Control</li> <li>• 2A: Graduated control options</li> <li>• 2B: Four-box grid</li> </ul>
3. Social media	<ul style="list-style-type: none"> <li>• Control</li> <li>• 3A: Slider</li> <li>• 3B: Private mode</li> <li>• 3C: Responsive toggles</li> </ul>

To develop design ideas and sketches, we drew on a number of approaches. In particular, we applied the behavioural science principles identified in our literature review and ran workshops with the project team and external experts. The key behavioural science principles are summarised in Table 3 and more details are available in the interim report.<sup>28</sup> Examples 1-3 below show excerpts of the final interfaces and the blue numbers on the interfaces provide some examples of where the corresponding behavioural principles were applied.

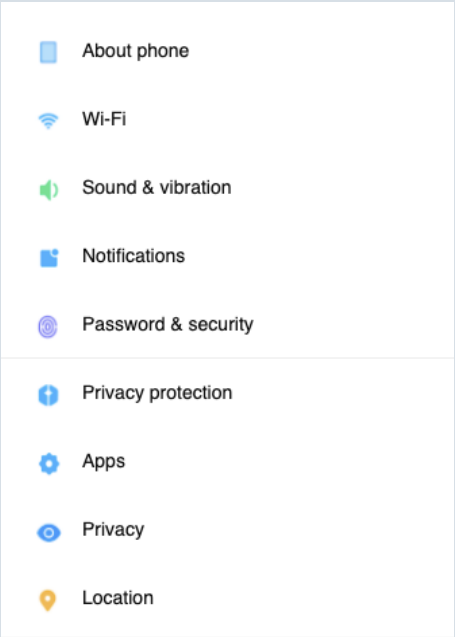
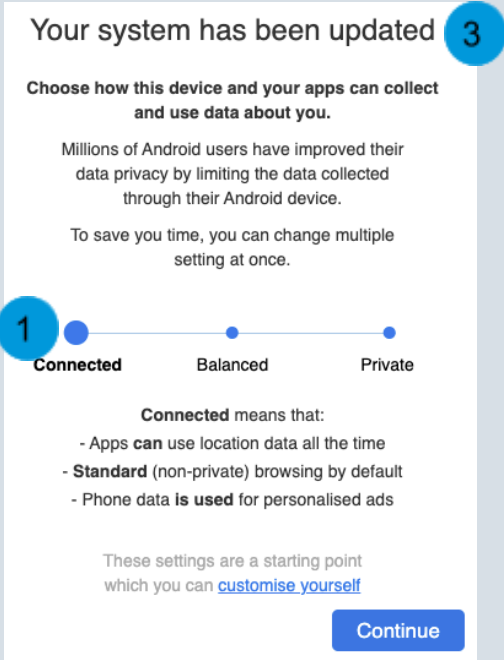
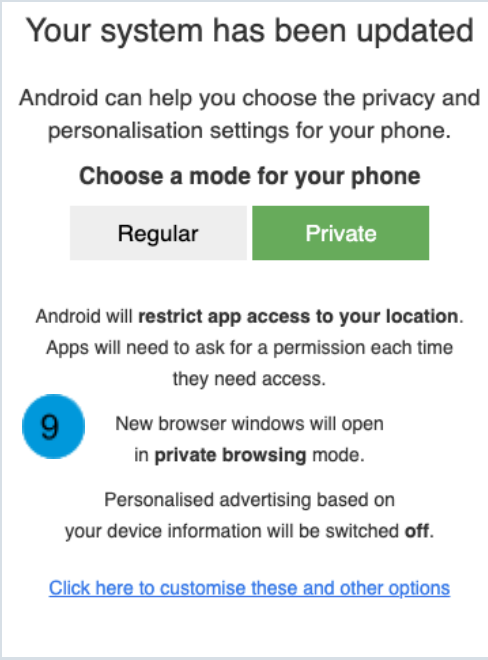
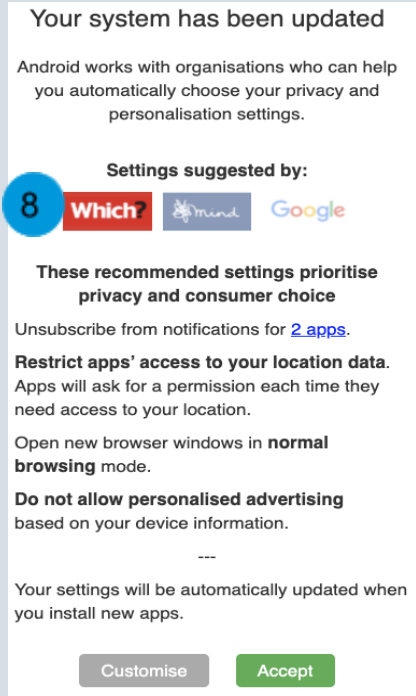
<sup>27</sup> These were mock-up designs. We used a number of common designs by well-known organisations as a baseline. We then simplified and modified the control interfaces to allow for fairer comparison with our designs. Our mock-up designs were not endorsed by any organisations.

<sup>28</sup> BIT (2020). [Active Online Choices: Designing to Empower Users. Summary of desk research](#)

Table 3: Summary of principles to improve user disclosure and choice

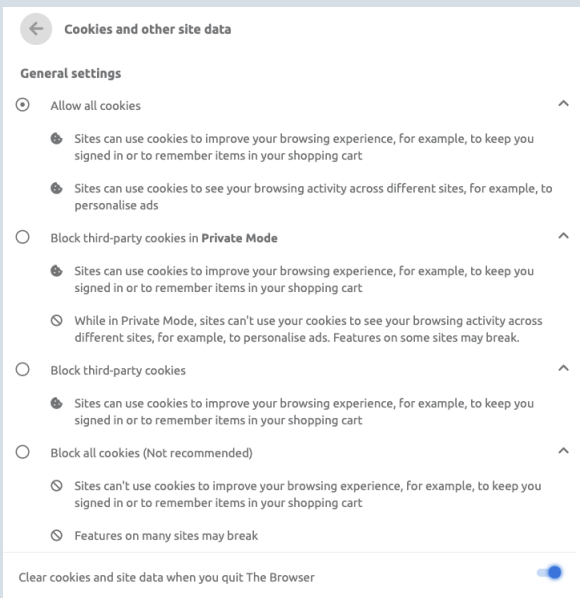
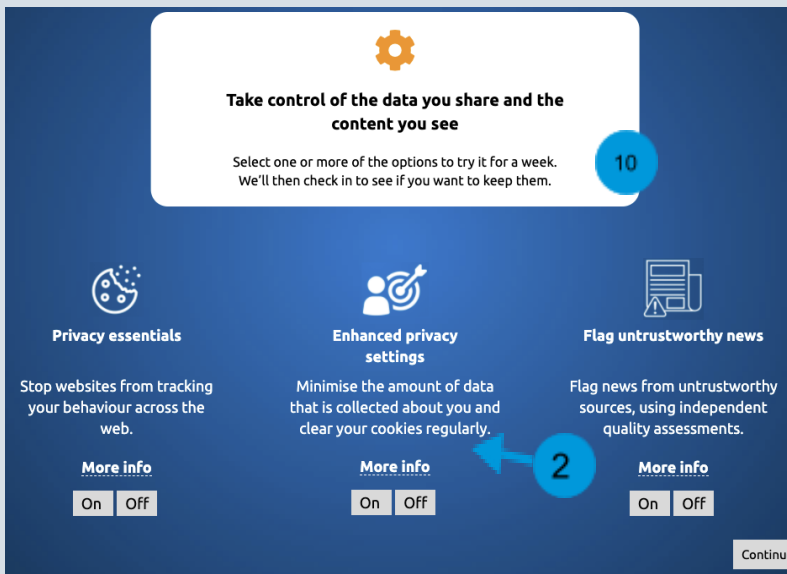
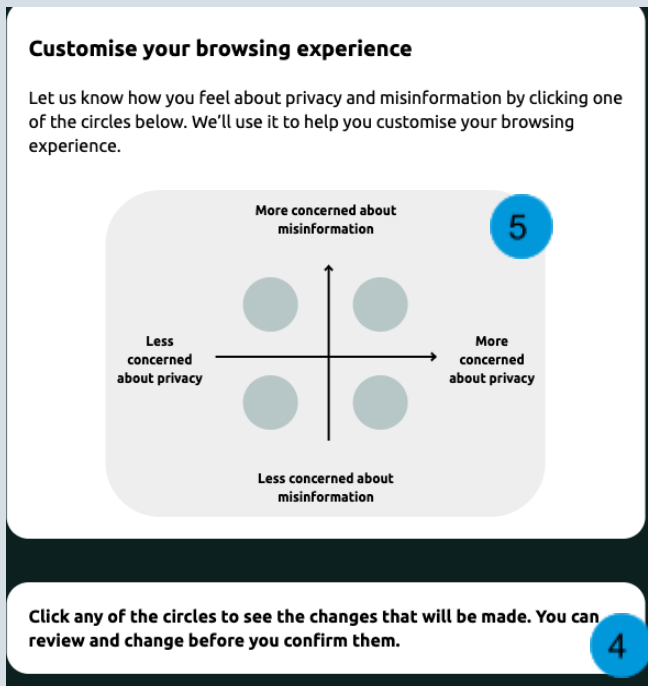
Principles	Key behavioural insights
Factors affecting effective information disclosure	
1. Recognise users' limited time and mental capacity	<ul style="list-style-type: none"> <li>• Shorten and simplify information as much as possible</li> <li>• Summarise information in bullet-points</li> <li>• Present information in short chunks and 'just in time'</li> </ul>
2. Maximise ease of navigation	<ul style="list-style-type: none"> <li>• Minimise the friction needed for people to find information (e.g. no. of clicks)</li> </ul>
3. Consider the timing of disclosure	<ul style="list-style-type: none"> <li>• Disclose information at timely moments, such as when a service changes</li> <li>• Disclose information early in a journey</li> </ul>
4. Personalise the content	<ul style="list-style-type: none"> <li>• Tailor information to the user</li> <li>• Only show content that is relevant</li> </ul>
5. Make the information salient or visual	<ul style="list-style-type: none"> <li>• Make key information stand out</li> <li>• Use diagrams, visualisations or comics to help explain concepts</li> </ul>
Factors affecting active choice	
6. Check framing and defaults	<ul style="list-style-type: none"> <li>• Set fair and transparent defaults</li> <li>• Avoid steering decision making by removing defaults and forcing choices</li> <li>• Appreciate the nuances of framing, using existing research or by testing</li> </ul>
7. Make the trade-offs interactive	<ul style="list-style-type: none"> <li>• Allow people to interact with, or experience, what the choice means</li> </ul>
8. Find the right granularity of choice	<ul style="list-style-type: none"> <li>• Give choices at a level of granularity which is meaningful to people and can be understood</li> <li>• Offering additional choices can in itself can reduce privacy concern and increase willingness to disclose</li> <li>• Intermediaries may usefully aggregate choices for people</li> </ul>
9. Ensure comparability of options	<ul style="list-style-type: none"> <li>• Allow people to make direct comparisons across options by providing consistent information</li> </ul>
10. Allow people to help their future selves	<ul style="list-style-type: none"> <li>• Offer tools for people to set reminders, commitments, or time-limits on the choices they set today</li> </ul>

## Example 1: Smartphone

Control	1A: Slider	1B: Private mode	1C: Trusted third party <sup>29</sup>
<ul style="list-style-type: none"> <li>Settings not relevant to the task were removed/made inactive to make it more comparable to the intervention designs.</li> <li>This design had preselected options.</li> </ul>	<ul style="list-style-type: none"> <li>Sliders have been effective in aiding consumer decision-making in other contexts, such as <a href="#">finance</a>.</li> </ul>	<ul style="list-style-type: none"> <li>The concept of a 'private mode' should be familiar to ~50% users from private browsing modes on web browsers.</li> </ul>	<ul style="list-style-type: none"> <li>Users could delegate choice to a third party organisation.</li> </ul>
	<ul style="list-style-type: none"> <li>None of the options were preselected.</li> <li>Explanations appeared when a user clicked on one of the options.</li> </ul>		
			

<sup>29</sup> These were hypothetical examples using recognised names and do not constitute any organisation endorsing any design.

## Example 2: Web browser

Control	2A: Graduated control options	2B: Four-box grid
<ul style="list-style-type: none"> <li>Settings not relevant to the task were removed/made inactive to make it more comparable to the intervention designs.</li> <li>This design had preselected options.</li> </ul>	<ul style="list-style-type: none"> <li>Users had to make an on/off choice for each of the three options to be able to proceed. Users could select one or more of the option sliders</li> <li>The design encouraged a trial run for one week. Such functions should help people learn what they do and don't like in practice and engage on an ongoing basis.</li> <li>None of the options were preselected.</li> </ul>	<ul style="list-style-type: none"> <li>The design drew on ideas from the finance context, where a person can express a preference for risk, and an investment portfolio is automatically created without the need for the person to get into the details of the holdings.</li> <li>Visual presentation might make it easier to process information and understand choices.</li> <li>None of the options were preselected.</li> </ul>
		

## Example 3: Social media

Control	3A: Slider	3B: Private Mode	3C: Responsive Toggles																					
<ul style="list-style-type: none"><li>Settings not relevant to the task were removed/made inactive to make it more comparable to the intervention designs.</li><li>This design had preselected options.</li></ul>	<ul style="list-style-type: none"><li>As in 1A, using the slider concept that has been effective in aiding consumer decision-making in other contexts, such as <a href="#">finance</a>.</li><li>Choices were cumulative to minimise clicks but users could ‘unbundle’ the options by going into the settings.</li></ul>	<ul style="list-style-type: none"><li>As in Design 1B, the concept of ‘private mode’ might tap into people’s existing digital vocabulary.</li><li>Bundling a number of changes within a single switch removes friction for users to enact multiple privacy-enhancing changes.</li><li>Users could ‘unbundle’ the options in the customisation mode.</li></ul>	<ul style="list-style-type: none"><li>Choices were combined by topic but not bundled into a single toggle/choice.</li><li>The user received immediate feedback, with the content in the feed and the ads changing as the toggles were moved.</li></ul>																					
<div><div><div>Check a few important settings</div><div>Quickly review some important settings to make sure that you're sharing with the people you want</div><div>Unavailable</div></div><div><div>Manage your profile</div><div>Go to your profile to change your profile information privacy, such as who can see your date of birth or relationships.</div><div>Unavailable</div></div><div><div>Learn more with Privacy Basics</div><div>Get answers to common questions with this interactive guide.</div><div>Unavailable</div></div></div> <table><tr><td>Who can see your future posts?</td><td>Friends</td><td>Edit</td></tr><tr><td>Review all your posts and things you're tagged in</td><td></td><td><a href="#">Use Activity Log</a></td></tr><tr><td>Limit the audience for posts you've shared with friends or Public</td><td></td><td><a href="#">Limit Past Posts</a></td></tr><tr><td>Who can see the people, Pages and lists you follow?</td><td>Friends</td><td>Edit</td></tr><tr><td>Who can send you friend requests?</td><td>Friends of friends</td><td>Edit</td></tr><tr><td>Who can see your friends list?</td><td>Friends</td><td>Edit</td></tr><tr><td>Who can Look you up using the email address you provided?</td><td>Friends</td><td>Edit</td></tr></table>	Who can see your future posts?	Friends	Edit	Review all your posts and things you're tagged in		<a href="#">Use Activity Log</a>	Limit the audience for posts you've shared with friends or Public		<a href="#">Limit Past Posts</a>	Who can see the people, Pages and lists you follow?	Friends	Edit	Who can send you friend requests?	Friends of friends	Edit	Who can see your friends list?	Friends	Edit	Who can Look you up using the email address you provided?	Friends	Edit	<div><div></div><div><h3>Control your Feed</h3><p>Decide here what you want to see in your feed.</p><div><div>No filtering</div><div><div>Do not apply additional filters in The Feed</div><div><div>Filter out user-reported content</div><div>Stricter filtering of content flagged by others as unsuitable but which is still within our acceptable content policies</div></div><div><div>Filter out user-reported content AND all posts from untrustworthy news sources</div><div>Hide content that has been flagged by others AND content that isn't from the independently maintained list of trusted sources</div></div></div><div><div>More filtering</div></div></div><div><div>If you want to further customise these options, you can always do that in the Settings.</div><div>Continue</div></div></div></div>	<div><div></div><div><h3>Try The Feed in Private Mode</h3><p>You control how The Feed works. Choosing Private Mode means that:</p><ul style="list-style-type: none"><li>The ads you see will be based on your basic profile information only (age, gender, location), not <a href="#">data on your browsing behaviour</a>.</li><li>We will not use <a href="#">data on your browsing behaviour</a> to order the content in your feed. You will see the most recent posts first.</li><li>Your posts and photos will be shared with your friends and you'll be warned before <a href="#">sharing posts more widely</a>.</li></ul><p>If you activate Private Mode, we will not collect data on your activity on other websites and apps elsewhere.</p><div><div>Private mode</div><div>OFF</div><div>6</div></div><div><div><a href="#">Customise settings</a></div><div>Continue</div></div></div></div>	<div><div><h3>Control your Feed order and the ads you see</h3><div><div><div>Personalise ads. We use <a href="#">data on your browsing behaviour</a> to personalise the ads you see. When turned off, you'll see ads using your basic profile information only (age, gender, location).</div><div>ON</div></div><div><div>Personalise Feed order. We use <a href="#">data on your browsing behaviour</a> to prioritise the posts in your Feed. When turned off, you'll see the most recent posts first.</div><div>OFF</div></div></div><div><div>Continue</div></div><div><div>Latest posts first</div><div>7</div><div><div><div></div><div><div>BBC News</div><div>08 Jul 2021 at 12pm</div></div><div><div>The nest of Asian giant hornets - which can wipe out a colony of honeybees in hours - was sucked out of a tree using a vacuum hose.</div><div></div></div></div></div></div></div></div>
Who can see your future posts?	Friends	Edit																						
Review all your posts and things you're tagged in		<a href="#">Use Activity Log</a>																						
Limit the audience for posts you've shared with friends or Public		<a href="#">Limit Past Posts</a>																						
Who can see the people, Pages and lists you follow?	Friends	Edit																						
Who can send you friend requests?	Friends of friends	Edit																						
Who can see your friends list?	Friends	Edit																						
Who can Look you up using the email address you provided?	Friends	Edit																						

## 3.2 User journey

The user journey was consistent across all three experiments and is summarised in Figure 1. Participants were first presented with three personas with different data-sharing and privacy preferences and asked to select the persona they most identified with. They were then given the task, which was to interact with the interfaces and adjust the settings to match the preferences of a person called Alex. For example, if Alex preferred to enable cookies, the correct setting would be to have cookies enabled. They were then assigned randomly to one of the interactive trial interfaces and provided with more details about Alex's preferences.

See Figure 2 for an example of the task for the smartphone experiment. Descriptions of personas for all three experiments are provided in Table 4.

After engaging with the interfaces, participants were asked a series of questions to measure their understanding of the choices they had made, their opinions about the interfaces and how they felt.

Figure 1: Participant journey overview

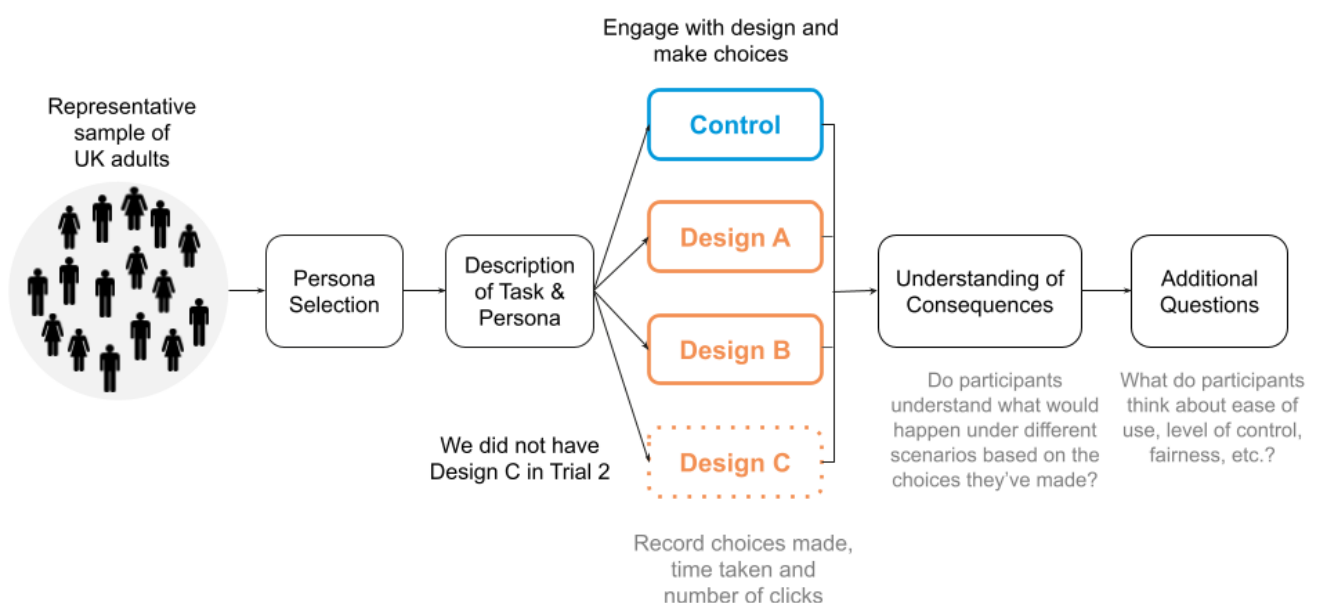




Figure 2: Task example - Smartphone

*“On the next screen, you will be shown a page similar to an Android phone’s device settings page. Please interact with the pages as you would if using them on your phone. Your task will be to adjust the settings to match the preferences of a person called Alex. For example, if Alex prefers to enable cookies, the correct setting would be to have cookies enabled.”*

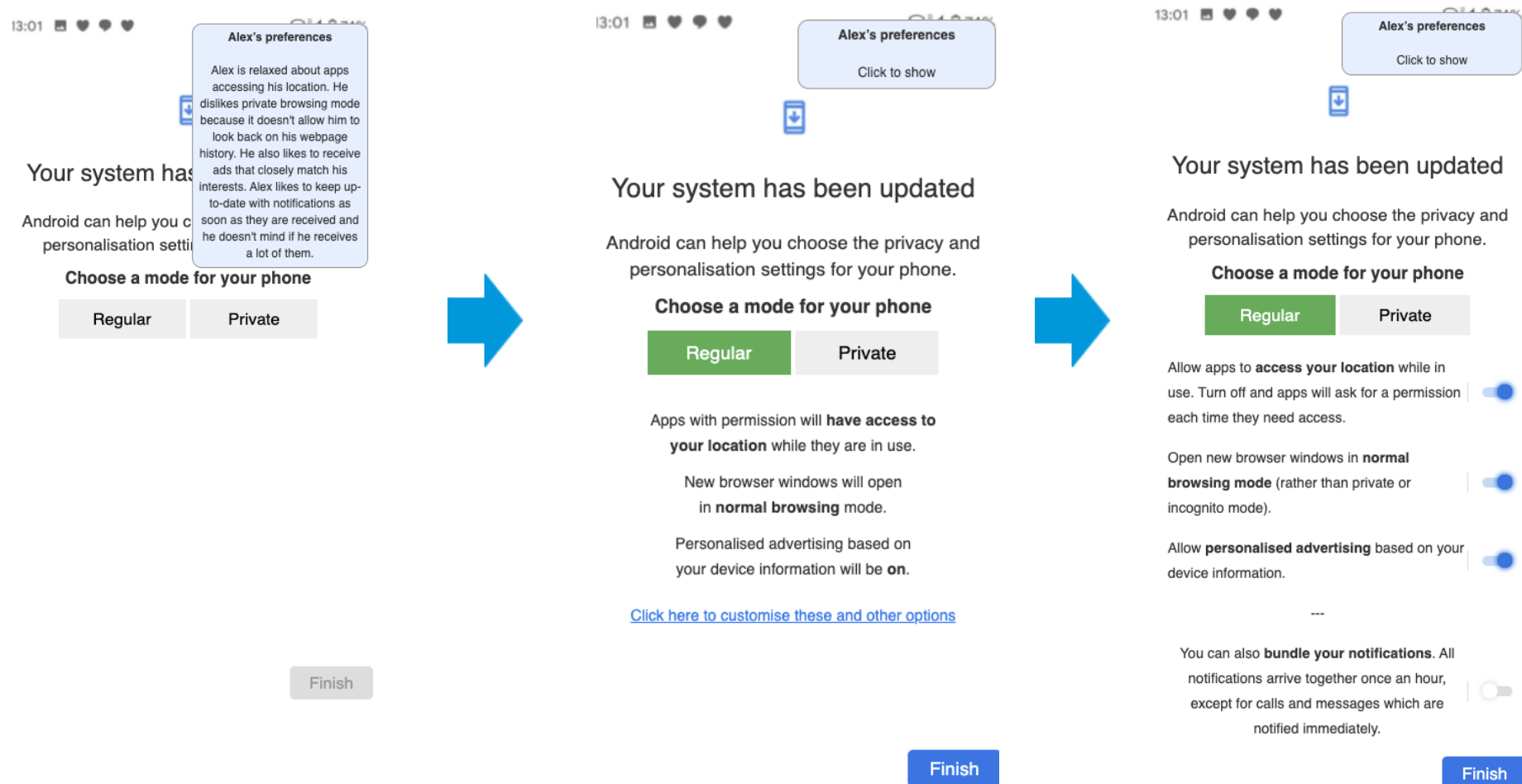


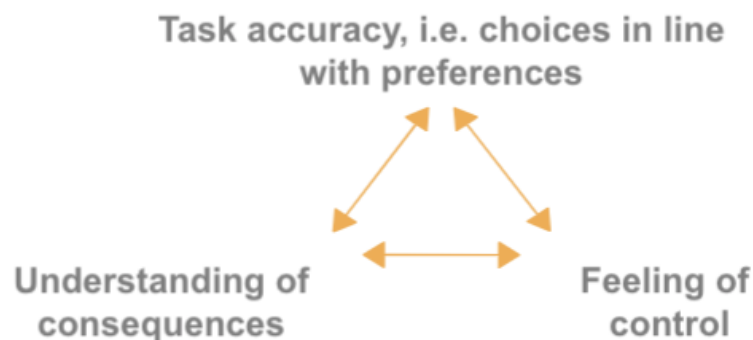
Table 4: Persona descriptions

Persona	Trial 1 (Smartphone)	Trial 2 (Web browser)	Trial 3 (Social media)
<b>Persona 1 (least concerned)</b>	Alex is relaxed about apps accessing their location. They dislike private browsing mode because it doesn't allow them to look back on their webpage history. They also like to receive ads that closely match their interests. Alex likes to keep up-to-date with notifications as soon as they are received and they don't mind if they receive a lot of them.	Alex likes to have their Feed personalised and prefers to see ads that closely match their interests, even if this means that The Network collects additional data about them. They don't like it when social media companies filter out content for them and would prefer to see posts from all sources. They are relaxed about their posts being publicly viewable.	Alex is relaxed about websites collecting data about their online behaviour, including what they do on other websites, because they like to receive ads that closely match their interests. They find it really annoying when websites don't remember their log in details or preferences from previous visits. Also, they prefer to form their own opinion on whether a web page or article is trustworthy or not.
<b>Persona 2 (partly concerned)</b>	Alex is happy with apps accessing their location when necessary, rather than having to grant permissions each time they open an app. They dislike private browsing mode because it doesn't allow them to look back on their webpage history. However, they would prefer not to get personalised adverts as they find that creepy. Alex likes to keep up to date with notifications as soon as they are received and they don't mind if they receive a lot of them.	Alex likes to have their Feed personalised, so that they see the most relevant content at the top. However, they find it intrusive when social media companies use [his] data for advertising and would rather not see personalised ads. They don't like seeing posts from untrustworthy news sources in their Feed. They want to share posts with friends by default.	Alex finds it creepy when websites collect data about their online behaviour on other websites. However, they find it really annoying when websites don't remember their log in details or preferences from previous visits. They prefer untrustworthy websites to be flagged while they're browsing so they can avoid misinformation and fake news.
<b>Persona 3 (most concerned)</b>	Alex doesn't feel good about their phone accessing their location. They'd rather use private browsing mode than have the browser remember their webpage history. They prefer not to get personalised adverts as they think it's creepy when companies collect data about the sites they visit. Alex feels like they receive too many notifications and finds them distracting (especially email and messaging apps).	Alex doesn't like it when social media companies use their browsing data for personalisation; they would rather see the most recent content in their Feed first and would rather not see personalised ads. They don't like seeing posts from untrustworthy news sources in the feed. They want to share posts with friends by default.	Alex finds it creepy when websites collect data about their online behaviour both on the website itself and on other websites. They prefer deleting data websites hold on them regularly, even if it means that their login details won't be saved. They prefer untrustworthy websites to be flagged while they're browsing so they can avoid misinformation and fake news.

### 3.3 Outcome measures

During the exploratory research, we identified three components of active choices (Figure 3). These formed our key outcomes to measure. Below we explain briefly how we measured them. Further details including questions that participants were asked are available in the Technical Report.

Figure 3: Main outcomes



#### Primary Outcome - Task accuracy

The core aim of this work was to improve people's ability to make choices in line with their preferences. The primary outcome in the experiment was therefore **task accuracy**, defined as the number of settings choices that participants made in line with the preferences of their selected persona. The types of preferences for each trial are summarised in Table 5.

Table 5: Settings choices by trial

Trial 1 (Smartphone)	Trial 2 (Web browser)	Trial 3 (Social media)
<ul style="list-style-type: none"> <li>• Notification frequency</li> <li>• Personalised advertising</li> <li>• Private browsing (by default or not)</li> <li>• Location tracking by an app</li> </ul>	<ul style="list-style-type: none"> <li>• Cross-site tracking</li> <li>• Clearing cookies regularly</li> <li>• Content filtering</li> </ul>	<ul style="list-style-type: none"> <li>• Personalised ads</li> <li>• Personalised feed order</li> <li>• Content filtering</li> <li>• Sharing posts publicly</li> </ul>

#### Secondary Outcome: Feelings of control

The concept of an active choice implies that users have an understanding of the consequences of that choice; one of our secondary outcomes was designed to measure this. Specifically, we measured whether people **felt in control** over the privacy settings using a single question with a 5-point answer scale from 'No control' to 'Complete control'.

#### Secondary Outcome: Understanding of consequences

We also measured **understanding of consequences** by giving participants short scenarios and asking what the outcome would be based on the choices they've just made. We measured the sum of correct answers, which were based on the settings participants'

selected in the task even if these choices were not in line with the persona's preferences.

### **Exploratory outcomes**

We conducted exploratory analysis to investigate whether the results varied across different demographic groups and depended on which persona a participant chose. Our exploratory outcomes also included some additional questions to capture participants' attitudes to and opinions of the designs. We measured:

- Task accuracy by demographic characteristics: gender, age, household income, location, education level
- Task accuracy, feelings of control and understanding of consequences by persona choice (for each design)
- Task completion time
- Number of clicks to complete the task

Participants were also asked questions to measure the following perceptions and attitudes. All questions had 5-point response scales.

- How easy or hard was it to make choices on behalf of Alex (a single question with a 5-point response scale)
- Trust that the choices were presented with your best interests in mind
- Whether the choices were presented in a fair way, allowing you to form your own opinions without being influenced (a single question with a 5-point response scale)
- Whether the settings were explained in 'lay terms' (easy for people to understand)
- Whether participants had as much control over the settings as they would have liked when making choices for Alex

## 4. Results of the online experiments

### 4.1 Sample characteristics and descriptive statistics

All participants were recruited via Predictiv. We aimed to achieve a sample representative of the general UK population and applied quotas for sex, age, household income, and location. No quotas were used for education and race. Information on sample characteristics, attrition checks and descriptive statistics is in the Technical Report.

Table 6 below shows the final sample size for each trial and the proportion of participants choosing each persona.

Table 6: Sample size and persona choice

	Trial 1 (Smartphone)	Trial 2 (Web browser)	Trial 3 (Social media)
<b>Final eligible sample</b>	n = 1,984	n = 2,012	n = 2,016
<b>Persona 1 (Unconcerned)</b>	25%	30%	16%
<b>Persona 2 (Partly concerned)</b>	62%	48%	53%
<b>Persona 3 (Very concerned)</b>	13%	22%	31%

### 4.2 Smartphone experiment (Trial 1)

#### Task accuracy

Participants achieved significantly higher accuracy on the task (changing settings in line with persona preferences) in the treatment designs compared to the control. The slider design showed the highest increase, 21pp compared to the control design. The private mode design and the trusted third party design performed similarly, increasing accuracy by around 14pp.

Figure 4: Smartphone - task accuracy

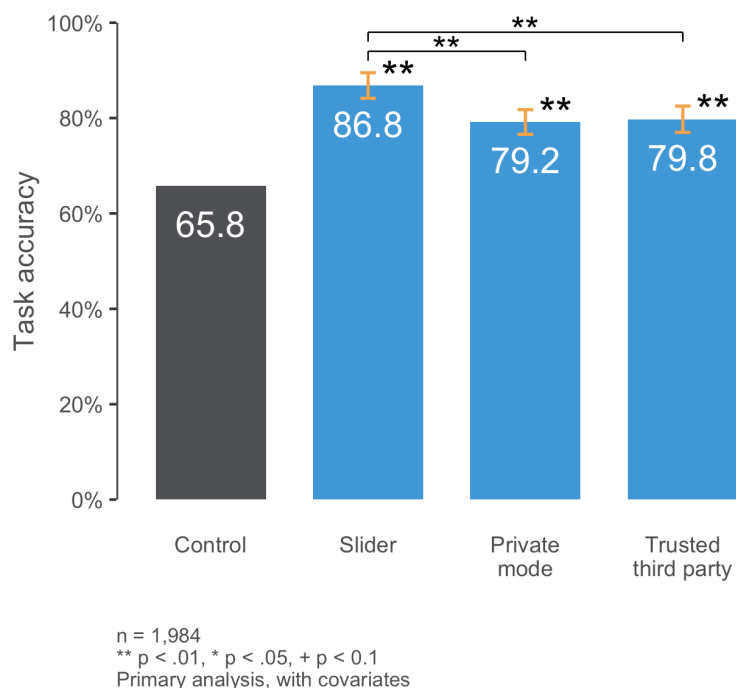


Figure 5 shows that mean performance varied by persona, with participants selecting persona 2 ('party concerned') or persona 3 ('most concerned') performing worse on average than those who selected persona 1 ('least concerned').

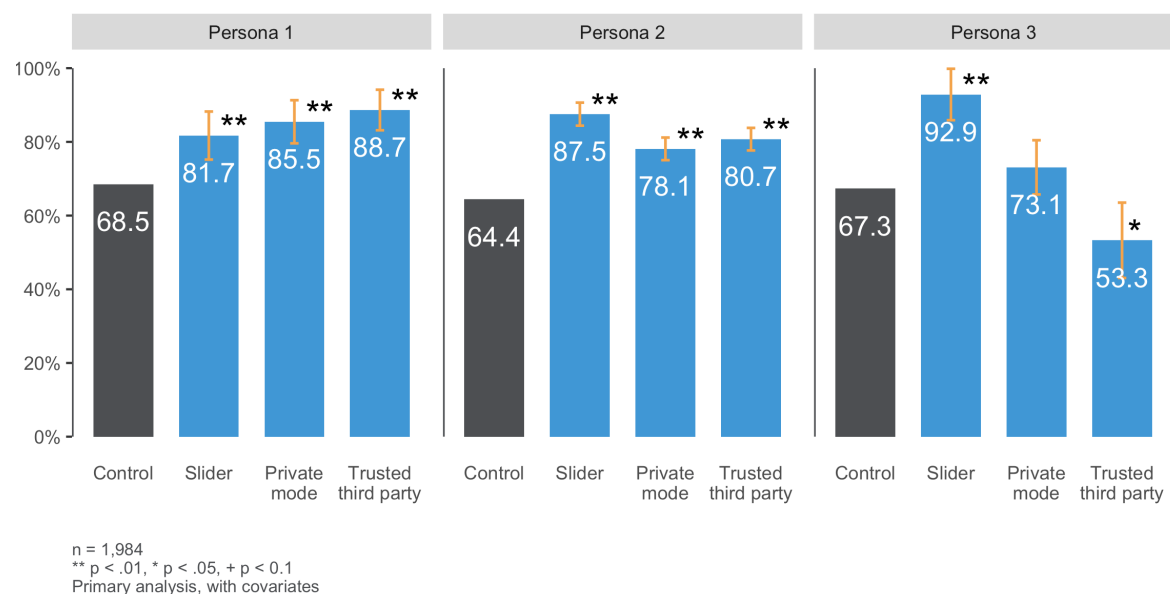
Performance of the designs also varied depending on the persona choice. The slider design performed well across the board, but especially for persona 3 ('most concerned').

The private mode design did not significantly outperform control for persona 3 ('most concerned'). This was because most participants did not make a correct choice for notifications. The notification option was only accessible via the customisation screen and could not be activated with the 'Private' button. Participants with persona 3 who selected 'Private', and then submitted got this setting wrong. We discuss the implication of this in [Section 5](#).

The trusted third party design performed better than the control for persona 1 ('least concerned') and worse than the control and all other designs for persona 3 ('most concerned'). This was affected by the participants' tendency to select the technology company, whose default settings were closely aligned with those of Persona 1 'least concerned'.<sup>30</sup> Participants with persona 3 who selected the technology company as a trusted third party (rather than the mental health charity or consumer organisation) needed to make a lot of manual adjustments to do the task correctly. Again, we discuss the implications in [Section 5](#).

<sup>30</sup> These were hypothetical examples using recognised names and do not constitute any organisation endorsing any design.

Figure 5: Smartphone - task accuracy

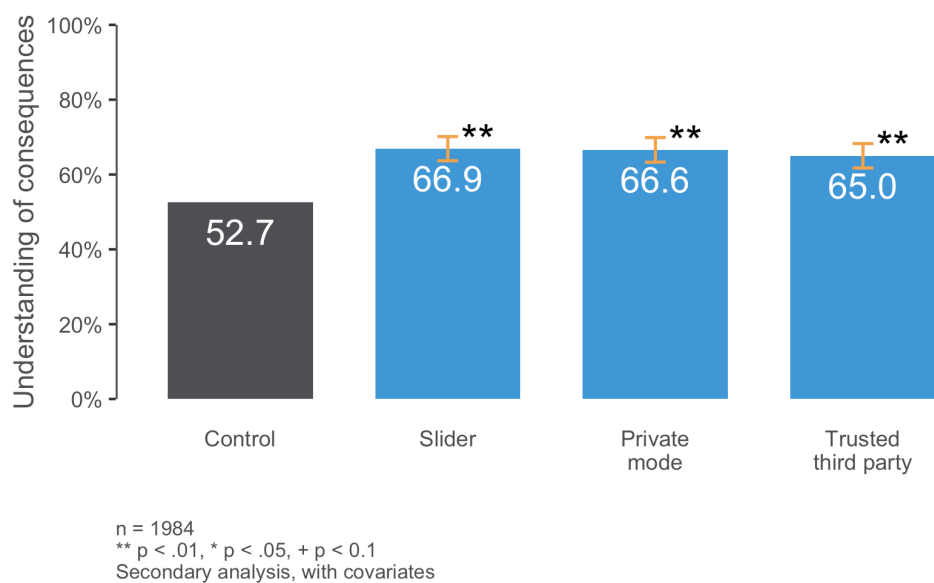


*Note: Persona 1 = 'least concerned', Persona 2 = 'partly concerned', Persona 3 = 'most concerned'*

### Understanding of consequences

Participants had significantly better understanding of the consequences of their choices (measured by four comprehension questions) in the treatment designs compared to the control design. Differences between the treatment designs were not statistically significant.

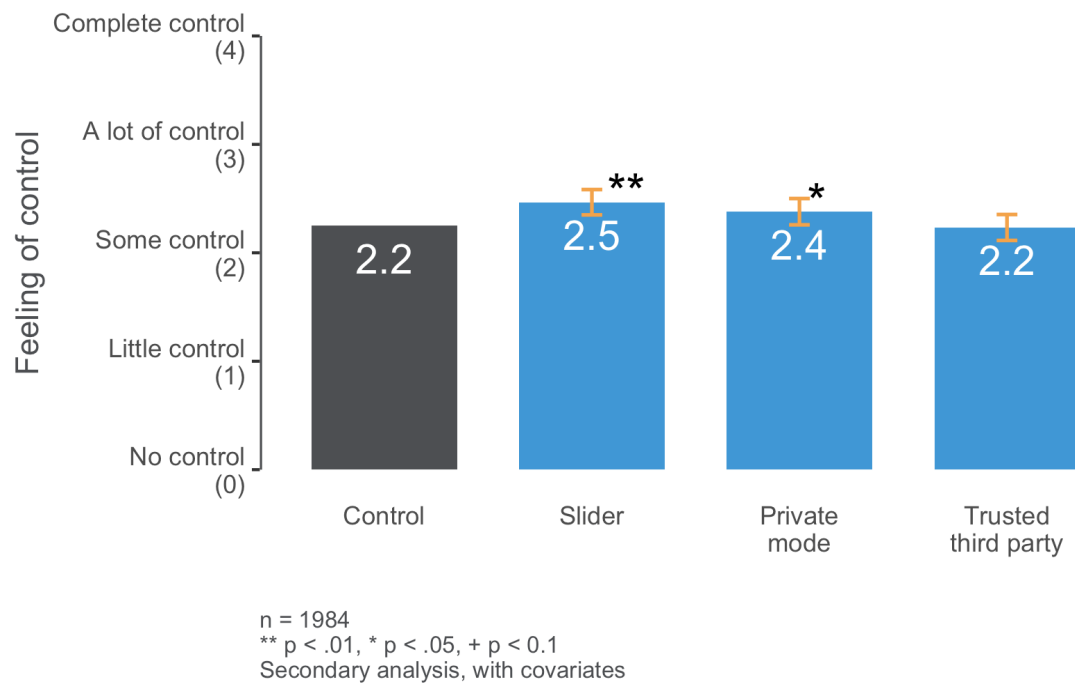
Figure 6: Smartphone - understanding of consequences



## Feelings of control

Participants reported significantly higher feelings of control (measured by a single sentiment question) in two of the treatment designs, slider and private mode, compared to the control. The trusted third party design did not perform better than the control on this outcome measure. The difference between these two designs was not statistically significant.

Figure 7: Smartphone - feelings of control



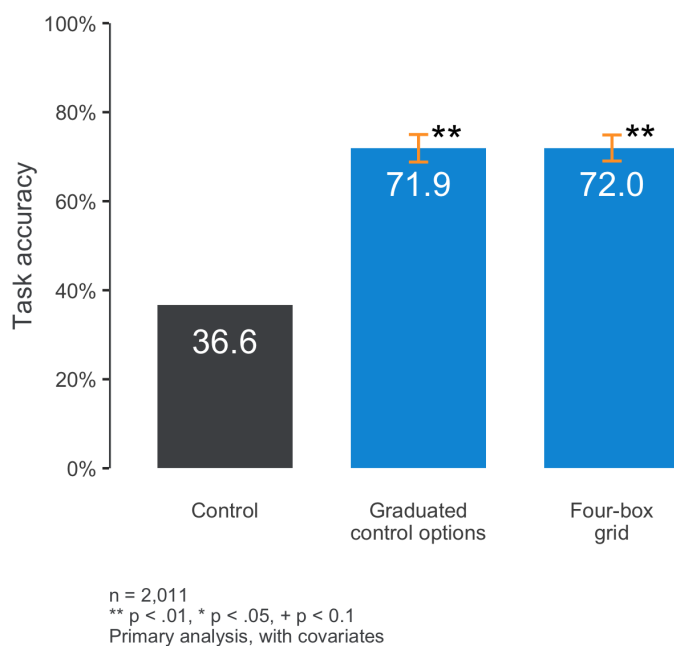


## 4.3 Web browser experiment (Trial 2)

### Task accuracy

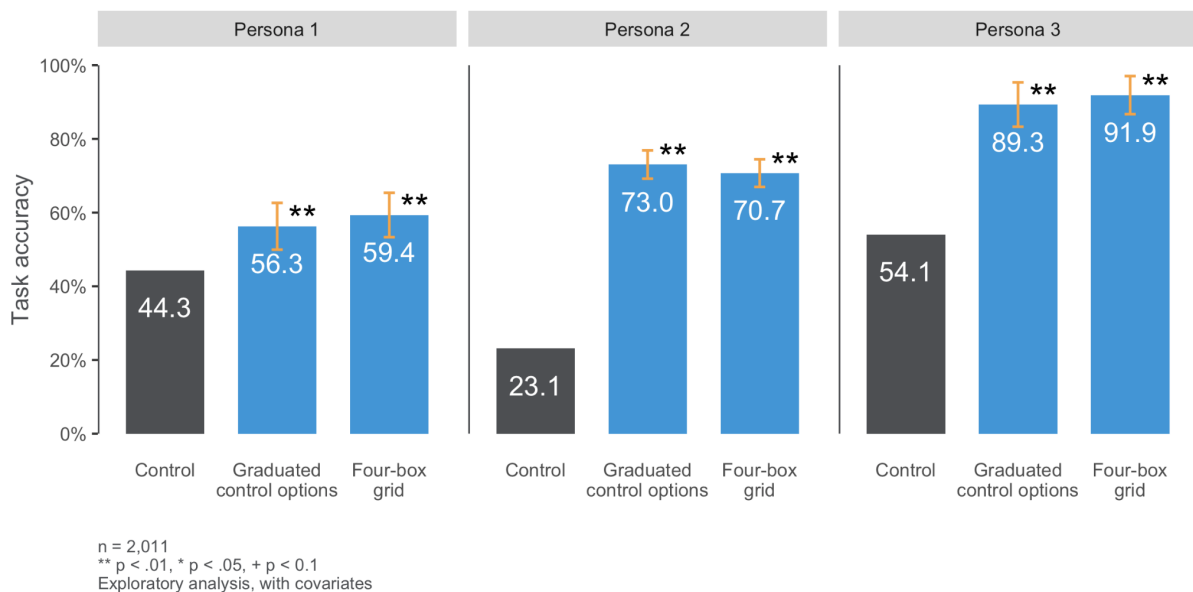
Participants achieved significantly higher accuracy on the main task (changing settings in line with persona preferences) in both treatment designs compared to the control. The two treatment designs, graduated control options and four-box grid, performed similarly, increasing accuracy by around 35pp.

Figure 8: Web browser - task accuracy



The additional exploratory analysis showed that these results hold even if we consider each persona separately (Figure 9). Baseline performance (task accuracy in the control) and the observed treatment effect differed across the personas. The treatment designs had the biggest impact on the task accuracy for persona 2 ('partly concerned') where the score increased by almost 50pp from a low baseline of 23%. Our research design was not set up to explain these differences, however some hypotheses are presented in the Technical Report.

Figure 9: Web browser - task accuracy by persona

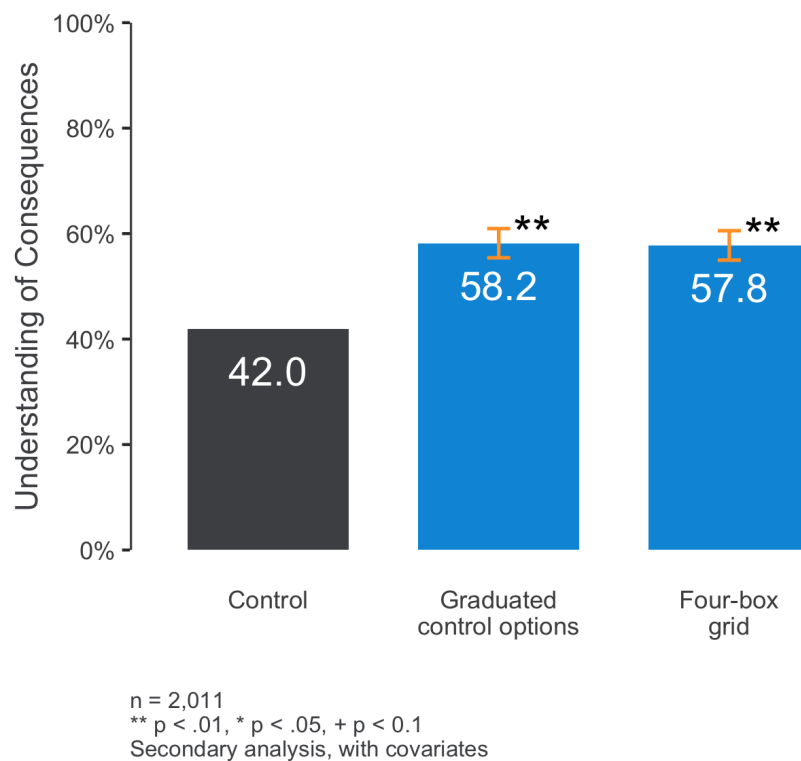


Note: Persona 1 = 'least concerned', Persona 2 = 'partly concerned', Persona 3 = 'most concerned'

### Understanding of consequences

Both treatment designs improved the understanding of the choice consequences compared to the control design by 16pp. There were no significant differences between the two treatment designs.

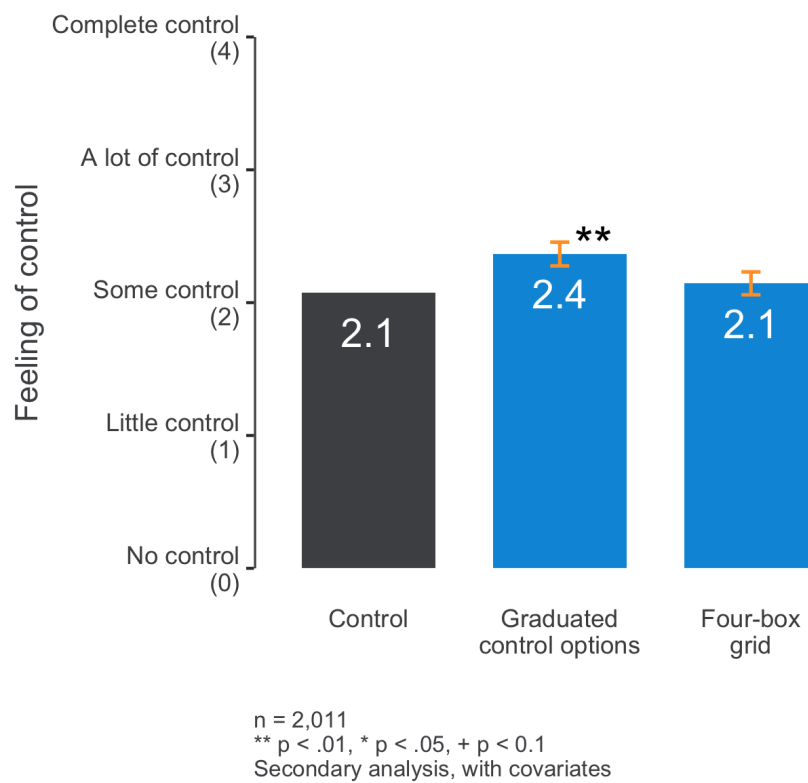
Figure 10: Web browser - understanding of consequences



## Feelings of control

The graduated control options design led to a 14% increase in the reported feelings of control compared to the control design. The four-box grid design did not outperform the control.

Figure 11: Web browser - feelings of control



## 4.4 Social media platform experiment (Trial 3)

### Task accuracy

We did not find any significant differences in task accuracy between the four designs. On average, participants made just over 70% of correct choices.

Figure 12: Social media - task accuracy

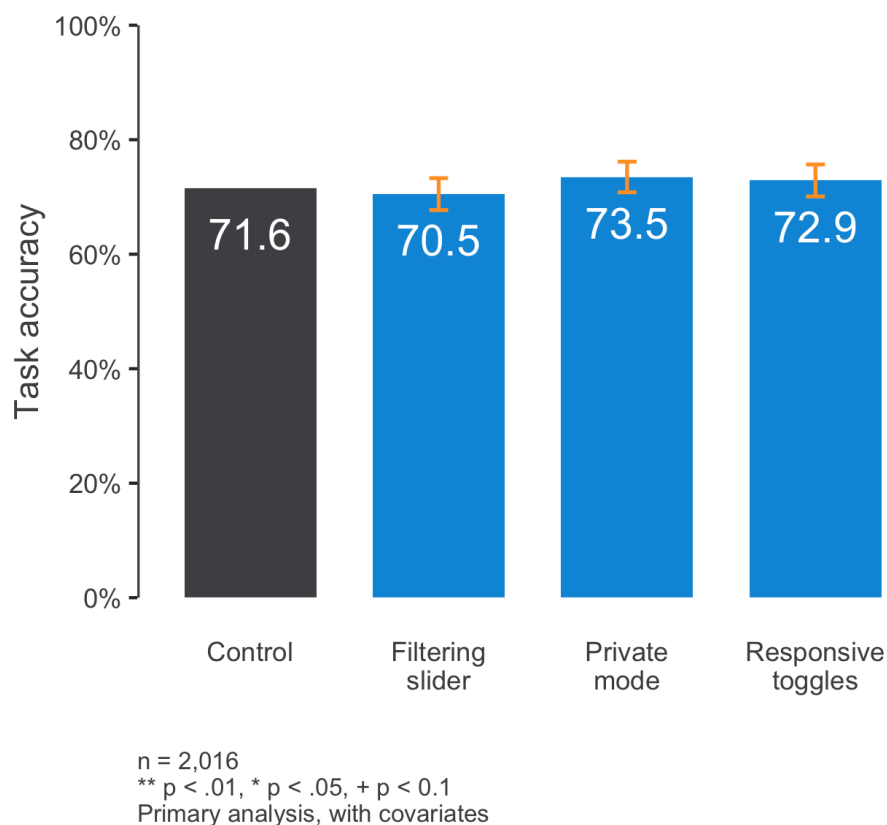
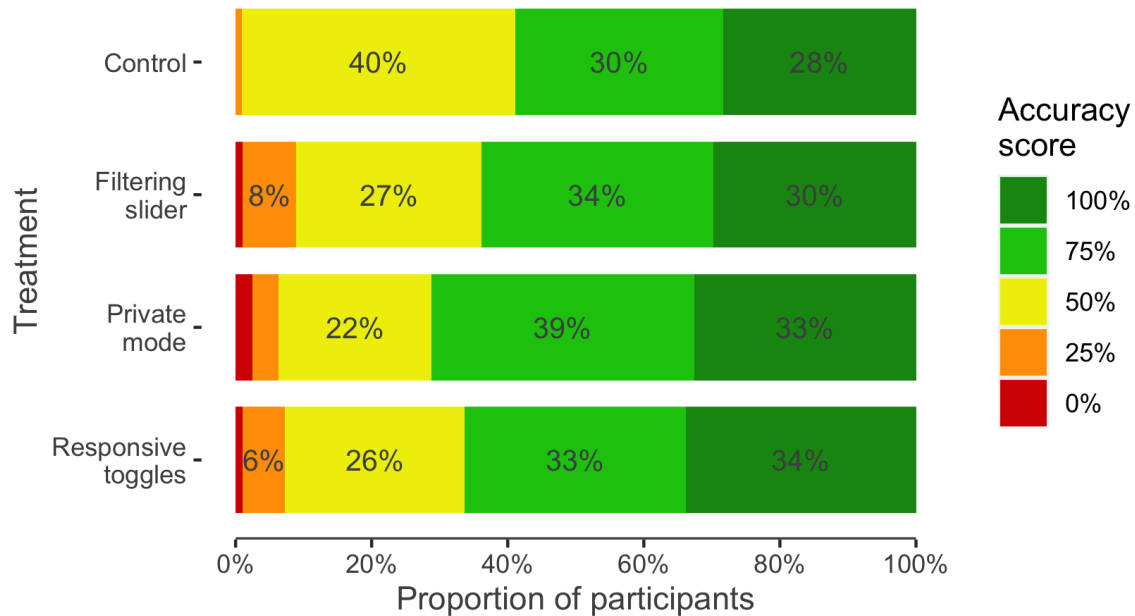


Figure 13 shows the performance of each design in more detail. In the control design, the majority of participants achieved an accuracy score of 50%. This was the default score a user got without making any changes to the settings. Over one half of the participants achieved a score of either 75% or 100%, and very few participants scored 0 or 25%.

In all three alternative designs, the proportion of participants achieving above-default scores (75% or 100%) was higher than in the control design. However, the proportion of participants achieving low scores (0% or 25%) was higher as well. This suggests that while some users benefited from the redesigned interfaces, others performed worse. We suspect this could have been because the intervention interfaces made it easier to change several target settings with one click. As a result, it was also easier to make mistakes if a participant did not fully understand the task or were confused by the options. For example, in the private mode design a single 'Private Mode' button affected three of the four target settings and 2.5% of the participants scored 0 (out of 4) on this task.

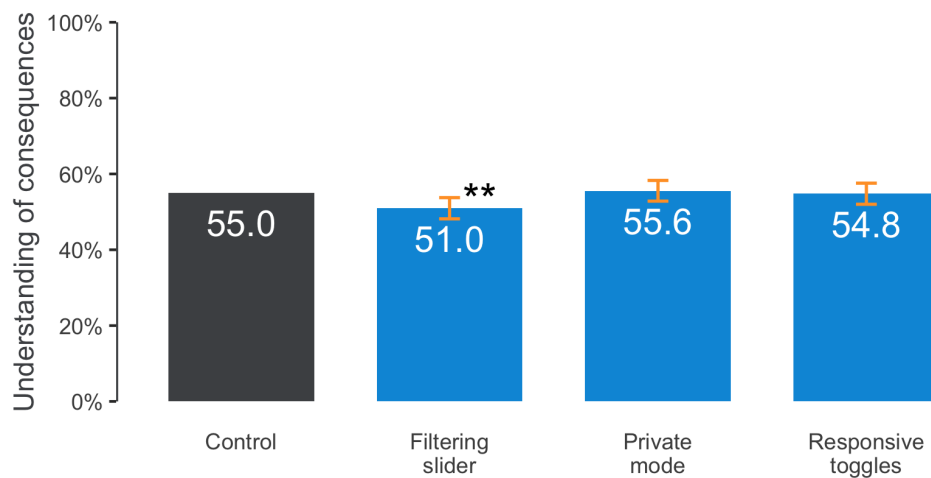
Figure 13: Social media - distribution of accuracy scores across treatments



### Understanding of consequences

There was no improvement in the understanding of consequences in any of the experimental designs. The scores were fairly low across all designs, with typical accuracy just over 50%. The filtering slider design performed significantly worse than the control, however, the difference was only 4pp.

Figure 14: Social media - understanding of consequences

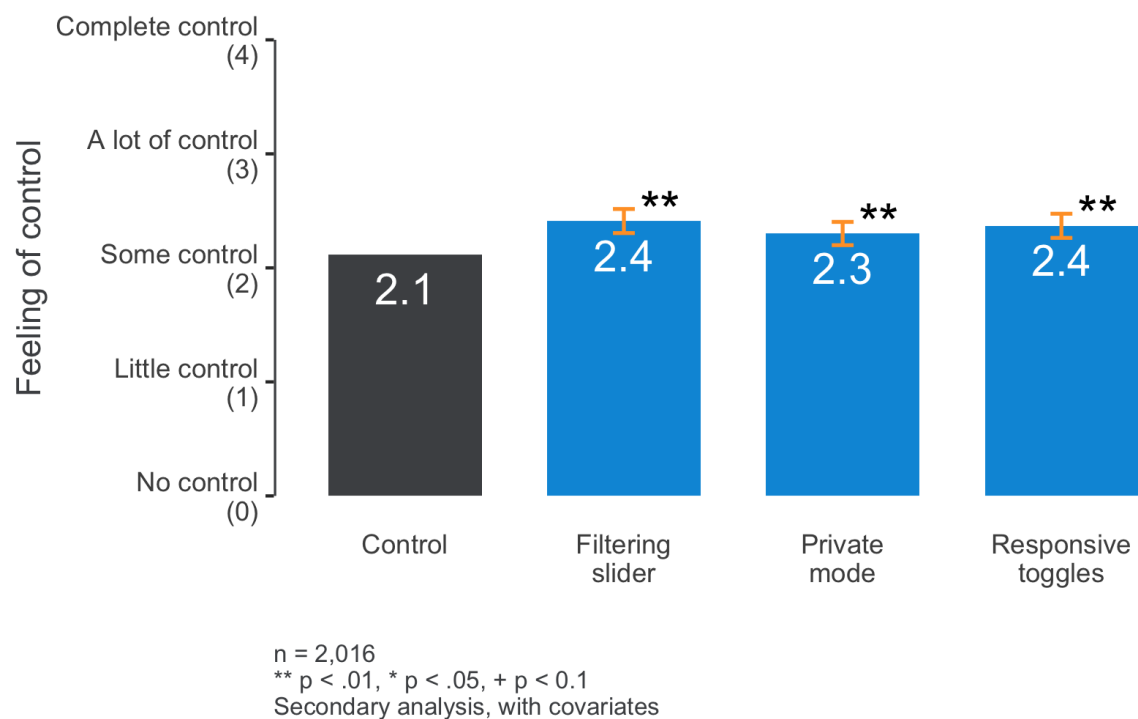


n = 2,016  
 \*\* p < .01, \* p < .05, + p < 0.1  
 Secondary analysis, with covariates

## Feelings of control

Participants reported significantly higher feelings of control in all three treatment designs, compared to the control. Those in the control arm gave an average rating of 2.1 out of 4, corresponding to “some control”. All treatment designs made participants feel significantly more in control, with average scores up to 2.4, roughly halfway between the “some control” and “a lot of control”.

Figure 15: Social media - feelings of control



## 5. Key findings and limitations

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The aim of this project was to explore and demonstrate how to create active choices. That is, choices where people are empowered to reflect their wishes without obstruction, based on an understanding of the consequences. We developed and tested alternative approaches in an effort to challenge tech companies to create better opportunities for people to shape their use of technology in line with their own values and preferences.

Although an online experiment with simplified interfaces and a limited number of choices cannot fully replicate the experience of using technologies in everyday life, there were some encouraging findings that point to the benefits of active choice design:

- **In both the smartphone and web browser experiments, some of our treatment designs outperformed the control designs<sup>31</sup> across all three outcomes.** We saw sizeable increases in task accuracy — between 13pp (20%) and 21pp (32%) across all three treatment designs in the smartphone experiment and around 35pp (96%) in both treatment designs in the web browser experiment. All of our treatment designs also led to significant increases in understanding of consequences in these two experiments. Feelings of control increased in the slider and private mode designs, but not the trusted third party design in the smartphone experiment. In the web browser experiment, the feelings of control increased in the graduated control options design, but not in the four-box grid design.
- **Improvements in task accuracy through the use of simplification and bundling did not come at the expense of understanding of consequences or feelings of control.** When developing the experiments we had concerns that simplification and bundles could reduce the understanding of choices because users would not need to make as much effort to understand each of the settings. Also, the feelings of control could reduce when users were offered bundles instead of many individual settings — we tried to mitigate these two concerns by providing clear explanations about the content of the bundles and having an option to customise them. Some of our ‘bundle’ designs led to improvements in all three outcomes. This suggests that at least in some areas it’s possible to avoid trade-offs between the ease of choosing options that are aligned with preferences and how well users understand these options and feel in control.
- **At the same time, there was no ‘one size fits all’ solution.** No one design significantly outperformed all other designs across the three main outcomes. The performance of designs also varied by persona chosen. Nevertheless, descriptive results did not indicate that there were any consistent differences between overall task accuracy scores across participants who chose different personas. We also found that there were differences in

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<sup>31</sup> We chose a number of common existing interfaces as a baseline. The purpose of this was to have a realistic control. We then simplified and modified the control interfaces to allow for fairer comparison with our designs. Our mock-up designs were not endorsed by any organisations.

persona choices depending on the trial. For example, only 13% of participants chose Persona 3 ('most concerned') in the smartphone experiment while 31% did so in the social media experiment. This suggests that levels of concern depend on the context (e.g. device/online setting, what privacy aspects are described, etc.). Our experiments were not designed to investigate what design features work best for people with different levels of concern.

The experiments generated some further useful learnings:

- **Our findings suggest that self-report metrics such as feelings of control are not a good indicator of the ability of people to make choices in line with preferences.** Our social media experiment showed that feelings of control can improve even if objective metrics such as task accuracy and understanding of consequences do not change. User perceptions are important, but using them as a single source of information to evaluate how well an interface supports them to make active choices is insufficient.
- **Designs need to be carefully tailored to users' levels of knowledge.** The designs tested in the social media experiment did no better than the control on task accuracy and understanding of consequences. But this does not necessarily mean that the underlying ideas do not work. Qualitative feedback indicated that we did not achieve the level of simplification of choices for users that we had sought. While some participants found the task clear and straightforward, others left comments that the language was too complicated or jargon-heavy, which left them confused.
- **New concepts that are unfamiliar to consumers, such as delegating choices to a third party, require careful explanation and implementation.** Overall, the trusted third party design in the smartphone experiment performed better than the control in terms of task accuracy and understanding of consequences. Nevertheless, task accuracy was significantly lower than in all other designs including the control for participants who chose the 'most concerned' persona. We believe that when choice bundles are recommended by a third party, people's willingness to choose the bundle may be influenced by being familiar with the organisation and its associations with the digital world. As a result, some users may not pay much attention to what comprises a bundle recommended by a well-recognised digital technology brand, and instead choose it even if it does not match their preferences.
- **In designing for active choice, clear labelling of options, transparency and testing are crucial to ensure that simplification and bundles do not disadvantage any user groups and that people are able to fully align choices with their preferences.** The downside of simplification and choice bundles is that consumers may accept bundles without checking that the choices they entail align fully with preferences. This appears to have affected the results for the trusted third party and the private mode designs for persona 3 ('most concerned') in the smartphone experiment. This indicates the importance of clear labelling of options, transparency and testing. Moreover, grouping options based on users' ideas about which settings are related, rather than what the



developers find logical, could make it easier for users to navigate and understand the choices.<sup>32</sup>

## Limitations and further research

**A major limitation of our work was that our experiments did not aim to replicate the full range of choices consumers face across all of their devices, nor all possible combinations of preferences.** Further, we did not look at how participants would make repeated choices over a longer period of time, so we were unable to examine whether our findings persisted if people made such decisions every week or month, for example.

Nevertheless, we see these experiments as a useful step in terms of testing alternative ideas, the best of which can be developed further. Useful further research could be done to test some of our design ideas ‘in the field’, or in other words, real life settings. A promising avenue of further exploration is looking at the best ways to combine options, as well as the optimal moments in time and frequency to engage with users. It would also be valuable to investigate the differences we observed across participants who chose different personas, and to develop designs with the most vulnerable groups of users in mind.

Importantly, more research is needed on delegating decisions to trusted third-parties. In particular, it is important to understand whether better labelling and disclosure could help people choose an organisation whose bundle aligns with their preferences.

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<sup>32</sup> TTC Labs (2021). [How to make privacy settings easier to find using better names and organization](#).

## 6. Implications

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Our findings highlight promising ideas for facilitating active choices, in line with user preferences, which can be built upon, tested further and scaled. We acknowledge the limited scope of our online experiments and the implications below therefore relate mainly to scaling generalisable principles, rather than the specific interfaces we tested.

### Implications for policymakers and regulators

- **Consent is not enough.** Regulatory outcomes that focus only on users consenting to how their data is used creates incentives for organisations to use techniques to obtain that consent most efficiently. However, obtaining consent is not necessarily a marker that the user has made choices in line with their preferences and understood the consequences. **Therefore these frameworks should have active choice at their centre. Regulatory frameworks for online interactions should incorporate active choice requirements where appropriate.**
- **The Digital Regulation Cooperation Forum should work with technology companies to develop best practice on ways to combine or bundle choices and reduce complexity for users.** Requiring users to make a myriad of decisions each time they use a service risks overwhelming them and discouraging active engagement altogether. For example, instead of every website asking visitors for cookie permissions, web browsers could enable users to choose overarching preferences for different types of cookies for different types of websites (e.g. government/public sector websites, e-commerce websites, etc.).<sup>33</sup>
- **The Digital Regulation Cooperation Forum should conduct further research into delegating choices to trusted third parties and consult with leading consumer protection and civil society organisations to develop practicable applications of this approach.** Even though the trusted third party design did not perform well across all personas, we see such choice bundles as a promising area for policy development and mitigating the increasing complexity. As this is a new concept, we recommend that further research and engagement in this area are commissioned.

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<sup>33</sup> We recognise there may be technical limitations to develop this particular feature. This example is used to illustrate the broader point.

## Implications for industry, including service providers and independent developers<sup>34</sup>

- **Companies should apply the same level of service optimisation for active choice in settings as they do to other parts of their platform design.** Companies should develop, adapt and test their interfaces to ensure they prioritise choices that reflect users' wishes without obstruction, based on an understanding of the likely consequences. Companies should publish their development and findings.
- **Companies should further develop and deploy the approach of bundled choices.** When combining choices into bundles companies must seek a balance between providing sufficient and transparent information while not overwhelming users to the point that the benefits of having a bundle are depleted.
- **Companies should dedicate significant resources to the development of active choice as part of their platform development and design.** In this small-scale project, conducted without the funding or expertise available within technology companies we found evidence of the tangible benefits of active choice prototypes. With the innovation and capacity at the technology industry's disposal, far more is possible.

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<sup>34</sup> We are not making recommendations to any particular organisation whose interfaces we used to develop the control designs or whose name we used in the trusted third party arm.