

# **Online news**

### Research update

Welsh translation available

Published 25 March 2024

### **Contents**

#### Section

Overview	3
Online intermediaries have a growing influence over news	6
Impacts on people and news publishers	13
Designing interventions is a complex task	22

### **Annexes (published separately)**

- A1. Media plurality online: attention to news on social media
- A2. Online intermediaries and the diversity of news content
- A3. Online news: qualitative research

### **Overview**

In <u>Media plurality and online news: Discussion document</u> (our '2022 Discussion Document'), we set out our initial findings on the potential impact that search engines, news aggregators and social media platforms (or 'online intermediaries') can have on people that use them to consume news.

This report builds on that evidence base. It sets out the findings from our newly commissioned research exploring online intermediaries' influence over online news and the impact it has on people. It also summarises insights from new academic literature.

In our Discussion Document, we identified concerns that people who most often use social media to access news are less likely to correctly identify important factual information, feel more antipathy towards people who hold different political views and are less trusting of democratic institutions, than people who use TV and newspapers most often as a source of news. We also found that people are not always clear about the extent of the influence that online intermediaries have over the news they see.

Since 2022, we have carried out more research to better understand these concerns, which are thrown into sharp relief as we enter a year of elections across the globe, including the anticipated general election in the UK.

Our new research has focused on social media, reflecting the concerns identified in our Discussion Document. We found that:

- The ranking of news content in a social media feed has a substantial impact on the amount of time people spend viewing, reading, and engaging with news content.
- Social media platforms expose people to a lot of different news outlets. However, they tend to expose them to a narrower range of news topics than they might encounter on a traditional news website.
- People have limited control over their social media newsfeeds and trying to design interventions to improve the breadth and quality of news consumed on social media is a complex task.

#### What our evidence shows - in brief

Online intermediaries remain major players in the news sector and an important source of news. 64% of UK adults use online intermediaries to access news. Meta is now the third largest news source in the UK after the BBC and ITV. 71% of 16–24-year-olds use social media for news, and this does not appear to change as they get older. The influence of online intermediaries extends beyond their own services, as they are often a key source of traffic for news delivered on traditional news websites.

Online intermediaries have significant influence over the news people see. In recent years, online intermediaries have been highly active at all levels of the news supply chain, except for news production (although this may be changing with new developments in AI). For example, they have significant influence over people's news diets through the way that they curate and present news articles. Our own research using eye tracking technology demonstrates that the ranking of an article in a social media feed has a significant impact on the likelihood that an article will be read, and the amount of attention it receives. There is also emerging evidence that social media may influence the type of news that is produced – distortions in user choices could therefore lead to distortions in news production.

People's needs are not always being met, and they lack control over the news that appears on their social media feeds. People who get their news from social media give it lower scores in terms of quality, accuracy, and trust than is the case with news from other sources. Both our 2022 research and our new qualitative study show that people have a limited understanding of the role online intermediaries play in curating the news that appears on their feed, and that the functions to edit the content they see are not sufficiently user-friendly to easily enable people to make changes.

People who get their news via social media may see less diversity of viewpoints in their news, as well as more polarising or false content. Our 2022 research showed that people who consume news primarily via social media are less knowledgeable, more polarised and have lower trust in democratic institutions compared to people who consume news via traditional media. Consistent with our concerns around echo chambers, recent research facilitated by Meta shows that social media news diets can be ideologically segregated and can contain large amounts of misinformation. Our new research analysing the content of news articles read online shows that people are exposed to a narrower range of topics when accessing news through social media compared to going direct to news publisher websites.

Social media platforms could have incentives to show like-minded, polarising, and false content. There is also evidence that like-minded, polarising, and false information drives user engagement, which means that platforms would have commercial incentives to promote that type of content. Research has also shown that platforms have strong incentives to keep people in 'automatic scrolling mode' because it keeps them on the platform for longer. People's decisions in 'automatic scrolling mode' tend to be more biased and recommender systems trained on automatic choices can also be biased.

Google and Meta have market power in some key markets news publishers rely on, leading to sustainability problems. News publishers say they depend on Google and Meta to drive traffic to their websites. They claim that negotiations with platforms are often unbalanced leading to unfair treatment. Publishers also rely on digital advertising markets to monetise the attention they get on their websites; the Competition and Markets Authority (CMA) found significant market power problems associated with Google's strong position in these markets which can depress returns to news publishers. As advanced forms of AI are increasingly used by online intermediaries, publishers may face new challenges from AI-generated news content.

### **Next steps**

'Media we trust and value' and 'a safer life online' are priority outcomes for Ofcom. Central to these outcomes are our duties with respect to public service broadcasters (PSBs), particularly ensuring they deliver their news obligations, and that all licensed broadcasters within the UK present their news in a duly accurate and duly impartial way. We also have duties to ensure UK audiences have access to a broad range of media providers and different editorial viewpoints.

Later this year, we will launch our next review of public service media (PSM). The review will consider the role PSBs have played in delivering trusted news over the period of 2018 to 2023 and explore the challenges and potential solutions to securing long-term sustainability of high-quality public service news output. We will look at whether the PSBs are delivering a range of high-quality, trusted and accurate, local, national, and international news to UK audiences, where they want to consume it.

The evidence set out in this report gives us a much greater understanding of online intermediaries, the role they play in influencing the news that people see online, and the impact that has on

people's news diet. These results and our ongoing research programme will feed into both the PSM Review, and our assessment of the risks posed to a trusted media environment from online intermediaries and emerging technologies.

In particular, we will continue work to understand how AI is being used in the media sector and the risks that AI could present. We already know that Generative AI is disrupting how news is created, verified, distributed, and consumed. We will look at the risks associated with this technology, which malicious actors can use to create false and deceptive content relating to news.

The rest of this report sets out in more detail the research we have done and reviewed since our last publication in 2022.

# Online intermediaries have a growing influence over news

Our evidence shows that search engines, social media, and news aggregators (which we refer to as online intermediaries) have become influential actors in the news ecosystem. Online intermediaries have taken on a significant role in key parts of the value chain from access, distribution and monetisation to discovery, prioritisation, and consumption of news online. When it comes to social media specifically, we have found that the ranking strategy of news content in their feed greatly affects people's attention and engagement with such content.

The news landscape is likely to change even more as advanced and readily available forms of AI, such as Generative AI¹ (GenAI), which includes Large Language Models² and chatbots, may be used to disrupt how news is created, verified, distributed, and consumed online.³ These technologies have the potential to offer substantial benefits for both news media distribution and content generation, but they also pose certain risks. For instance, malicious actors can use this technology to create deepfakes and deceptive content relating to current affairs or political figures,⁴ and with the integration of GenAI capability into functionalities such as search, online intermediaries could further influence how news is presented, accessed, and discovered online.

## Online intermediaries are an important source for news

The last decade has seen a lot of change in how people access news with online news sources generally becoming more heavily used. In 2023, our News Consumption Survey found that 68% of adults over 16 years old use online sources<sup>5</sup> to access news, giving it a comparable reach to TV (70%) and significantly greater reach than radio (40%) (**Figure 1**).<sup>6</sup>

Younger age groups are much more likely to use online sources and social media to access news, with 83% of 16–24 year-olds using online news sources and nearly three quarters (71%) using social media, and this does not appear to change as they get older.<sup>7</sup>

6

<sup>&</sup>lt;sup>1</sup> Generative AI (GenAI) broadly refers to machine learning models that can create new content in response to a user prompt. These tools are typically trained on large volumes of data, and can be used to produce text, images, audio, video, and code. For a more detailed discussion see: DRCF, 2023, Maximising the benefits of Generative AI for the digital economy; and Pattrn Analytics & Intelligence, 2023, Evaluating recommender systems in relation to the dissemination of illegal and harmful content in the UK, ('Pattern Report, 2023').

<sup>&</sup>lt;sup>2</sup> Language models are algorithmic systems able to generate text. Large Language models are trained on a large volume of text data – on the scale of tens of gigabytes –and generate text based on user prompts (Pattern Report, 2023).

<sup>&</sup>lt;sup>3</sup> Ofcom, 2024, <u>Ofcom Submission to the House of Lords Digital and Communications Committee: The future of news</u> ('House of Lords submission, 2024').

<sup>&</sup>lt;sup>4</sup> House of Lords submission, 2024.

<sup>&</sup>lt;sup>5</sup> The 'online news sources' category is broader than the 'online intermediaries' category since it covers news from any online source. It includes news publisher websites, apps, and online intermediaries.

<sup>&</sup>lt;sup>6</sup> Ofcom, 2023, News Consumption Survey, Figure 1.2 ('News Consumption Survey, 2023'). Reach in this instance refers to the proportion of UK adults that use a particular source for news. We measure this by asking people to list the news sources that they use for news nowadays.

<sup>&</sup>lt;sup>7</sup> News Consumption Survey, 2023, Figure 1.4.

Television (broadcast + BVoD\*\*\*)

Online\*\*

Social Media

Radio (offline + website/app)

Newspapers (print + website/app)

Figure 1. Main platforms used for news nowadays

Source: Ofcom, 2023, News Consumption Survey.8

More specifically, our 2022 Discussion Document found that two-thirds (64%) of online UK adults claim to use one or more online intermediaries to access news nowadays. <sup>9</sup> It is therefore clear that online intermediaries have a significant role in how audiences access news.

In terms of audience reach, our News Consumption survey 2023 reports that 37% of UK adults use Meta platforms for news nowadays, which places Meta third after the BBC and ITV (**Figure 2**). <sup>10</sup> Google (23%), X (formerly Twitter) (17%) and TikTok (10%) also have significant reach as a source of news amongst UK adults. <sup>11</sup> While Meta, Google and X (formerly Twitter) have had significant reach for a number of years, TikTok has grown its reach rapidly in the last few years (from 1% in 2020). <sup>12</sup>

<sup>&</sup>lt;sup>8</sup> COMBINED F2F & ONLINE sample. Question: C1. Which of the following platforms do you use for news nowadays? Base: All Adults 16+ - 2023=4556, 2022 W2\*=2792, 2020=4576, 2019=4691, 2018=4618.

\*2022 W1, and 2021, data not shown because face-to-face fieldwork was not possible during Covid-19 pandemic. \*\*Internet includes use of social media, podcasts and all other websites/apps accessed via any device. \*\*\*On-demand/catch up TV services included for first time in 2023. Green/red triangles indicate statistically significant differences between 2023 and 2022 (at 99% confidence level).

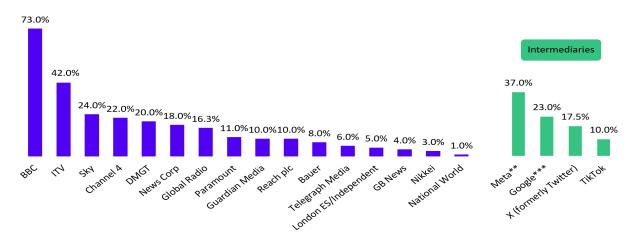
<sup>&</sup>lt;sup>9</sup> Ofcom, 2022, <u>Discussion document: Media plurality and online news</u>.

 $<sup>^{10}</sup>$  Meta platforms include Facebook, Instagram, and WhatsApp.

<sup>&</sup>lt;sup>11</sup> News Consumption Survey, 2023, Figure 1.6.

<sup>&</sup>lt;sup>12</sup> News Consumption Survey, 2023, Figure 1.5.

Figure. 2. Cross-platform retail providers used for news nowadays 2023



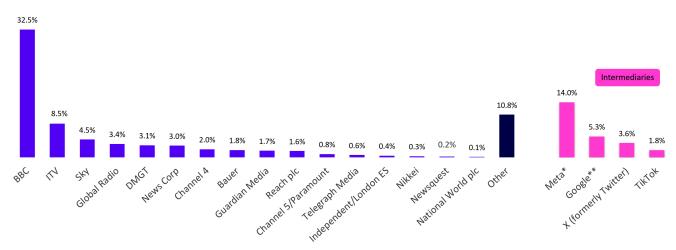
Source: Ofcom analysis based on 2023 News Consumption Survey data. 13

By an alternative measure, 'share of attention,' Meta is the second most important news source. Share of attention is a measure of the potential influence of a particular news source over people. It uses the same data reported above on the news sources people use (**Figure 2**), but also includes data on how often people use each news source and takes into account the range of different news sources people use. Shares of attention will give a higher ranking for a particular news source than audience reach where people use that news source more intensively and/or where people use few other sources. <sup>14</sup> Meta has a share of attention of 14%, and Google (5.3%), X (formerly Twitter) (3.6%), and TikTok (1.9%) also have significant shares of attention (**Figure 3**).

<sup>&</sup>lt;sup>13</sup> Question: D2a-D8a. Thinking specifically about <platform>, which of the following do you use for news nowadays? Base: All adults 16+ 2023=4556. Meta\*\* = Facebook + Instagram + WhatsApp. Google\*\*\* = Google News + Google + YouTube.

<sup>&</sup>lt;sup>14</sup> Share of attention calculates the relative attention given to a news source by a group of people. It is first calculated at the individual level; by measuring each individual's attention to a specific news source and then by expressing that as a share of the total amount of attention the individual has given to all of the news sources the individual used. These shares are then aggregated across individuals, to produce the news source's overall share of attention for the group as a whole. In this case we measure a person's attention to news sources using the number of visits she has made, to each of the news sources she uses, in a month.

Figure 3. News source share of attention for UK adults 2023



Source: Ofcom analysis based on 2023 News Consumption Survey data. 15

# Online intermediaries are an important source of traffic for other news websites

In addition to being an important source of news in their own right, online intermediaries such as Facebook and Google are also an important source of traffic for other news websites. **Figure 4** below shows that people most commonly access news websites by going directly to news publishers' websites (accounting for almost half of all visits). However, around three-in-ten (29%) of all visits to new publishers' websites come via online intermediaries. If we exclude the BBC, which most people access directly, this figure rises to nearly four in ten (38%), and there are some news websites that rely on Google and Facebook for more than half of their traffic.<sup>16</sup>

<sup>&</sup>lt;sup>15</sup> Question: D2a-D8a. Thinking specifically about <platform>, which of the following do you use for news nowadays? Base: All adults 16+ 2023=4556. Meta\*\* = Facebook + Instagram + WhatsApp. Google\*\*\* = Google News + Google + YouTube.

<sup>&</sup>lt;sup>16</sup> <u>Discussion Document</u>, 2022, p. 13; and Ofcom, 2022, <u>Media Plurality and Online News Annex 5: Ipsos Iris passive monitoring data analysis</u>, ('Ipsos Iris passive monitoring data analysis, 2022').

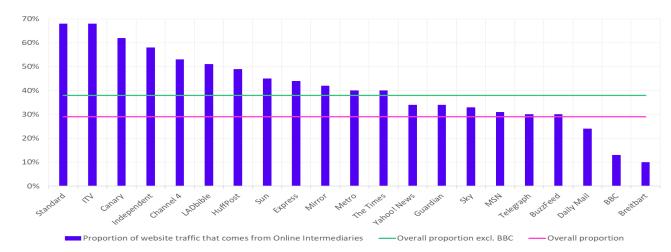


Figure 4. Proportion of website traffic that comes from online intermediaries, 2021

Source: Ofcom analysis of Ipsos Iris data. 17

## Social media can influence what news articles their users read

There is now a well-established literature which shows that our choices can be influenced by the context in which we make decisions as well as by our cognitive biases. <sup>18</sup> Online intermediaries have control over the environment in which their users make choices about what news to read. This gives them the ability to influence their users' choices in a wide variety of different ways, which significantly vary depending on the type of online intermediary as well. For example, the recommender system <sup>19</sup> of a social media platform and its ranking strategy can influence the position of an article on the newsfeed, while the ordering of the results showed in response to a query on a search engine can affect how likely it is that people will read it. <sup>20</sup> Online intermediaries can also decide how news items are presented (e.g. the inclusion of an image and/or associated text) or whether news is presented as part of a mix of other material or together on a specialist news page.

To better understand how such design choices can impact attention and engagement with news content, we focused on social media platforms specifically and explored the ranking of news content in social media feeds. To

\_

<sup>&</sup>lt;sup>17</sup> Ofcom analysis based on Ipsos Iris passive monitoring data from 2022 research ('Ipsos Iris passive monitoring data analysis, 2022').

<sup>&</sup>lt;sup>18</sup> See for instance: Sunstein and Thaler, 2008, <u>Nudge: Improving decisions about health, wealth, and happiness</u>, Yale University Press; and Revealing reality, 2021, <u>Pathways: How digital design puts children at risk</u>.

<sup>&</sup>lt;sup>19</sup> By recommender system we refer to an automated tool that interfaces with a library of content hosted on a digital platform to surface specific content for users. It is a type of information retrieval and ranking system that suggests content to a service user, and it is powered by a set of algorithms. For a more detailed discussion about recommender systems see <a href="Pattern Report">Pattern Report</a>, 2023.

<sup>&</sup>lt;sup>20</sup> See for instance: Glick, Richards, Sapozhnikov et al., 2014, <u>How Does Ranking Affect User Choice in Online Search?</u>, Rev Ind Organ 45, 99–119.

<sup>&</sup>lt;sup>21</sup> There are significant differences between the ways in which search engines and social media' recommender systems work. For instance, search engines rank content from across the internet (an open database) based on the relevance to the query (as well other metrics such as trustworthiness, authoritativeness, and popularity). Social media's recommender systems autonomously curate newsfeeds based on the predicted relevance to the user from the platforms content pool (closed database).

do this, we commissioned an online experiment which used eye tracking technology to study the attention given to news items in a social media feed (see **Annex 1**). Our research measured how the ranking of news content in the content feed affected how much attention people devote to a news article.

Our eye tracking research found that news items placed at higher positions in the feed received significantly more attention. Participants were more likely to engage with and remember news items placed high up in the feed, compared to news items placed at lower positions in the feed. For instance, news stories at the top of the feed received around 14 times more total attention time compared to news items placed at the bottom of the feed (see **Figure 5**). This pattern holds consistently for desktop and mobile devices.

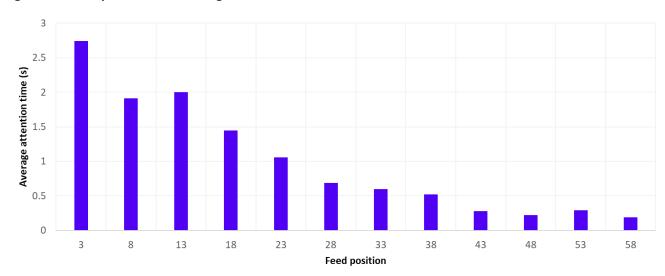


Figure 5: The impact of feed ranking on total attention

Source: Ofcom, 2023, Media Plurality Online: Attention to News on Social Media (Annex 1).

As shown in **Figure 5**, the average total amount of time spent on a news item decreases when it is placed lower in the content feed ranking. This overall effect on attention can be broken down into three components:

- News items at the top of the feed were around 4.5 times more likely to be viewed than those at the bottom (many of which received no attention at all from some users);
- When they were viewed, news items placed at the top of the feed were looked at for longer (around 3 times more attention time), compared to those at the bottom; and
- This was in part because news items at the top of the feed, when viewed, were also around three times more likely to be clicked on and expanded to the full article compared to items at the bottom.

The more time people spent viewing news items, the more they were able to remember them. Our study shows that news stories placed at the top of the feed were around 7 times more likely to be recalled by users than those placed at the bottom. This was partly because many users stopped looking before, they reached the end of the feed, so some news items at the bottom of the feed were not viewed at all. Amongst news items that were viewed, users were almost twice as likely to recall news stories they viewed at the top of the feed versus those viewed at the bottom.

This demonstrates that the relative placement of content on the content feed matters and that social media platforms can use the ranking in those feeds to steer people's choices and influence the news that they discover and ultimately consume online.

### Social media may influence news production

There is also emerging evidence that social media may also affect news production.

A recent study (Cagé et al. 2020) shows that publishers tend to align some of their news content with news topics that are popular on X (formerly Twitter). The study found that the popularity of a story on the platform increases the coverage of the same story by mainstream media, even when controlling for the public relevance of the story.<sup>22</sup>

Another recent study (Garz and Szucs 2023) appears to show that some news outlets may make editorial decisions based on how they expect social media to prioritise news content. In particular, they found that German publishers posted more politically substantive content on Facebook following announced changes to its recommender system.<sup>23</sup>

With the growing popularity of synthetic media and the use of GenAI capabilities by both online intermediaries and news publishers, impacts on news production may also increase.

<sup>23</sup> Garz and Szucs, 2023, <u>Algorithmic selection and supply of political news on Facebook</u>. The study investigated the impact of updates to Facebook's news feed recommender system which it announced in 2013 and 2014, which aimed to encourage more political coverage by increasing user exposure to quality content of news publishers and decreasing exposure to non-informative posts.

<sup>&</sup>lt;sup>22</sup> Cagé et al., 2020, <u>Social Media Influence Mainstream Media: Evidence from Two Billion Tweets</u> (last revised 2024). The study used a dataset including around 70% of all the posts on X (formerly Twitter) produced in France between August 2018 and July 2019, and the online content of 200 media outlets. The authors developed an algorithm to identify and link events on social and mainstream media.

# Impacts on people and news publishers

Our new research confirms that people still have limited understanding of how online intermediaries, in particular social media, can affect the news they are shown, and that they have a limited ability to control what news is shown to them. There is also growing evidence that shows that social media platforms have incentives to deliver news that lacks a diversity of viewpoints and contains material that is polarising or false.

Advanced forms of AI also present new challenges for news distribution, discovery, and access of news online. These technologies are increasingly used throughout the news value chain by both news publishers and online intermediaries and there is early evidence that their use in certain cases may lead to new harms and/or can exacerbate existing harms.<sup>24</sup>

### Impacts on people

### People have limited understanding of how online intermediaries can affect their news diet and want more control

Although audiences value the range of news content that they have access to online, they are often unaware of why certain stories are served to them or the degree of personalisation over news content that is possible.

In 2022, 46% of adults agreed that they would like total control over how their news and information online is tailored to them through use of their personal data.<sup>25</sup> However, many felt they lacked the information they needed to make informed choices. Our new qualitative research demonstrates that when directly prompted to review the news sources they followed on Facebook, some initially struggled to do this, as the features that should allow this review are embedded in the platform and are difficult to find (Annex 3).<sup>26</sup> This work showed that once participants were able to review the news sources they followed, they felt more empowered.<sup>27</sup>

"Must admit I liked reviewing the pages I currently follow and up to now I didn't know how easy it was to do this once instructed or indeed you could go do that at all, I now plan to do this on a regular basis and see if it tailors my news appetite a bit better."

Male, 55

<sup>&</sup>lt;sup>24</sup> See for instance: Cambridge Consultants, 2019, <u>Use of AI in online content moderation</u>; <u>House of Lords submission</u>, 2024.

<sup>&</sup>lt;sup>25</sup> Ipsos Iris passive monitoring data analysis, 2022.

<sup>&</sup>lt;sup>26</sup> Ofcom, 2024, Online news qualitative research ('Annex 3, 2024').

This finding refers specifically to Cohort 3. Cohort 3 recruited people who consume news from a range of non-mainstream/alternative news sources and asked them to either review the sources of news they followed online. For more details see the full report in Annex 3.

<sup>&</sup>lt;sup>27</sup> Annex 3, 2024.

### News on social media can lack a diversity of viewpoints and can expose people to material that is polarising or false

Social media platforms have specific characteristics and features that influence the incentives they face when they are deciding what news to show to their users. Evidence shows that how those incentives play out in practice may affect the news diets that social media platforms deliver to people.

#### Social media platforms' features and incentives

Social media platforms' revenues are primarily driven by sale of display digital advertising, and the value of this advertising is, in turn, driven by the amount of time people devote to the platform and the amount of data the platform can collect on them (which allows for better targeting of advertising). These platforms therefore appear to have strong incentives to act in ways that keep users on their services for as long as possible, and to encourage user interaction with the platform in order to collect more data and maximise user engagement.

Social media platforms also personalise content so that it is specific to each user. In traditional 'one to many' news formats such as a newspaper or a broadcast news bulletin; all readers or viewers get the same set of news items as other readers or viewers of that source. This means that the providers of those traditional services have a strong incentive to create a product that appeals to a broad base of users. This is not the case with social media platforms, which can give a vastly different news feed to each individual and are incentivised to show a narrow range of material focused on the interests of each individual.

To curate content on such feeds, social media platforms use recommender systems. Research has documented that such systems are frequently engineered to boost business metrics – such as clickthrough rates, user retention, ad revenue, or the time users spend on a platform – rather than optimising for different uses or value to their users. <sup>28</sup> In some instances, recommender systems designed to primarily increase engagement may also promote material that is potentially harmful. <sup>29</sup> This could be the case, for example, if the recommender system promotes material that is engaging but false or engaging but polarising. Recommender system may also reduce the prominence of material that reflects diverse viewpoints (such as counter-attitudinal news) if that material tends to reduce user engagement.

These platforms provide a space for their users to interact with content and with each other. This is a core function and a much-valued part of any social media service. However, groups may form where users do not see a diversity of viewpoints, where users become more polarised over time or in which users become more likely to be exposed to false information.

In some cases, recommender systems and user interaction can combine and feed on each other. Material that some users find engaging and interact with by liking, commenting, and sharing with their networks can be used by the recommender system as a signal to promote that material to

-

<sup>&</sup>lt;sup>28</sup> For a more detailed discussion see for instance <u>Pattern Report</u>, 2023; and 5RightsFoundation, 2021, <u>Pathways: How digital design puts children at risk</u>.

<sup>&</sup>lt;sup>29</sup> Our primary focus in this report is on societal harms such as a harm to the good functioning of the democratic process. This is a different to the types of harms addressed by the Online Safety Act 2023, which addresses harms to individuals, such as illegal content and certain categories of content that is harmful to children (See Ofcom, 2023, Ofcom's approach to implementing the Online Safety Act).

more users, who then interact and share the material and so on. This feature of social media could therefore exacerbate the propagation of polarising or false material.<sup>30</sup>

However, social media platforms are not primarily aimed at delivering news content, they tend instead to carry a wide range of types of content from a wide variety of sources. The content on these platforms is usually posted by users themselves, or by content providers such as the news publishers, and so is less closely associated with the brand of the social media service. Because of this, social media platforms may face weaker incentives to ensure the quality of the news content carried on their services than is the case for traditional news outlets.

It also should be noted that recommender systems of social media platforms may also have other incentives. For example, they may have an incentive to include some variety in recommendations to prevent the content becoming stale. They may have incentives to reduce the amount of polarising or false material their feeds if this material causes people to stop using their platform in the longer term. It is therefore the balance of these incentives and the incentives identified above that will ultimately determine what the social media platform will do in practice.

#### Social media platforms have incentives to show news content that is likeminded, polarising, or false

There is some evidence that people engage more and perceive a platform to be better quality if it shows them like-minded content. For example, a study by Bryanov et al. (2020) used a sample of users, who were paid to use a custom-made portal featuring real, timely articles over 12 days. <sup>31</sup> Participants were either assigned to a baseline newsfeed which showed the top news stories, or to a treatment group which featured these in addition to other stories from outlets that supported the participant's preferred party. They found that this partisan personalisation increased platform usage and perceptions of its quality. <sup>32</sup>

There are several studies which show that people engage more with material that could be considered polarising. Robertson et al. (2023) analysed the impact of negative and emotional words on online news consumption, using a series of randomised controlled trials that showed variations of news story headlines to different users. They found that negative words and sadness in headlines increased clicks.<sup>33</sup>

Rathje et al. (2021) analysed large datasets of posts on X (formerly Twitter) and Facebook from liberal and conservative media sources and members of Congress.<sup>34</sup> They used regression methods to examine how language about the 'out-group' (the political group that one does not identify with), the 'in-group' (one's own political group), and different emotions<sup>35</sup> predicted reposts on X (formerly Twitter) and Facebook shares. They found that references to the out-group in social media posts was the strongest predictor of engagement. Separately, negative, and moral-emotional words were generally associated with increased shares and reposts.

<sup>&</sup>lt;sup>30</sup> See for instance: Vosoughi et al., 2018 The spread of true and false news online, Science.

<sup>&</sup>lt;sup>31</sup> Bryanov et al. Effects of Partisan Personalization in a News Portal Experiment, Public Opinion Quarterly, 2020

<sup>&</sup>lt;sup>32</sup> However, the increased portal usage (i.e., impressions) did not produce a corresponding increase in the overall number of stories read (measured by the number of unique clicks on article headlines).

<sup>33</sup> Robertson et al. Negativity drives online news consumption, Nature Human Behaviour, 2023.

<sup>&</sup>lt;sup>34</sup> Rathje et al., 2021, Out-group animosity drives engagement on social media, PNAS ('Rathje et al, 2021').

<sup>&</sup>lt;sup>35</sup> Rathje et al., 2021. They counted how many words in each post on X (formerly Twitter) or Facebook referred to a liberal/conservative (using lists of Democrat and Republican politicians and liberal/conservative identity terms which have been used in prior research); or included negative emotion, positive emotion, or moral-emotional language (using previously validated dictionaries for these).

Beknazar-Yuzbashev et al. (2022) looked at 'toxic content' on social media, using a browser extension to hide toxic text content from a randomly selected group.<sup>36</sup> They found that a reduction in toxic content significantly reduced content consumption on Facebook (but had inconclusive results for X (formerly Twitter), and YouTube).<sup>37</sup>

Vosoughi et al. (2018) investigated the difference in the spread of verified true and false news stories distributed on X (formerly Twitter) from 2006 to 2017, tracking c.126,000 stories which were posted by c.3 million people, more than 4.5 million times. Using a range of measures to quantify the extent of rumour diffusion, they found that false news spread significantly farther, faster, deeper, and more broadly than the truth in all categories of information, and these effects were more pronounced for false political news. 39

### There is evidence that people make poor decisions when they are in 'automatic scrolling mode' and that recommender systems can be biased

In previous studies conducted by Ofcom we have found that a lot of news on social media is consumed incidentally and is generally passive. When people consume news in this way, they are much less aware of the source of the story they were reading or watching 40, or even that they have been exposed to news at all. 41 When people interact with news content, they may not always use critical skills when determining the legitimacy of news online and often look for short-cuts to help them make snap-judgments. 42 Evidence also suggests that people tend to overstate their ability to recognise false content, with younger age groups expressing the most confidence in their abilities to identify fake content. 43

A recent study by Agan et al. (2023) used lab experiments to show that when people behave automatically, biases creep in; snap decisions are typically more prejudiced than slow, deliberate ones, and can lead to behaviours that users themselves do not consciously want or intend. They also find that algorithms trained on data gathered from automatic behaviour are also more biased than algorithms trained on more deliberative choices. .<sup>44</sup> The study examined some real-world recommender systems and found evidence that, in the USA and India, Facebook's News Feed recommender system had significant bias against showing posts from people in a user's network, if they were from an 'out group'.

<sup>&</sup>lt;sup>36</sup> In this research, a 'toxic' statement was defined as "a rude, disrespectful, or unreasonable comment that is somewhat likely to make you leave a discussion or give up on sharing your perspective." A 'very toxic' statement was defined as "a very hateful, aggressive, or disrespectful comment that is very likely to make you leave a discussion or give up on sharing your perspective."

<sup>&</sup>lt;sup>37</sup> Beknazar-Yuzbashev et al., 2022, <u>Toxic Content and User Engagement on Social Media: Evidence from a Field Experiment</u>, Working paper at SSRN. Note that the drop in content consumption on Facebook was not accompanied by a change in the amount of time individuals spent on the platform.

<sup>&</sup>lt;sup>38</sup> Vosoughi et al., 2018 The spread of true and false news online, Science ('Vosoughi et al., 2018').

<sup>&</sup>lt;sup>39</sup> Vosoughi et al., 2018. This is despite the fact that users who spread false news tended to have fewer followers, were less active on X (formerly Twitter), were verified less often, and had been on X for less time. In addition, when bots were removed from the dataset, the results remained the same.

<sup>&</sup>lt;sup>40</sup> Revealing Reality, 2017, <u>Scrolling news: The changing face of online news consumption</u>.

<sup>&</sup>lt;sup>41</sup> Ofcom, 2022, Media Plurality Quantitative Report, Annex 7, ('Media plurality quantitative report, 2022'), p. 12.

<sup>&</sup>lt;sup>42</sup> Media plurality quantitative report, 2022, pp. 33-39.

<sup>&</sup>lt;sup>43</sup> Media plurality quantitative report, 2022, pp. 33-39.

<sup>&</sup>lt;sup>44</sup> Agan, Davenport, Ludwig, and Mullainathan, 2023, <u>Automating Automaticity: How the Context of Human</u> <u>Choice Affects the Extent of Algorithmic Bias</u>, NBER working paper.

### There is evidence that people can spend longer than they would like to on social media when they are in 'automatic scrolling mode'

Allcott, Gentzkow and Song (2022) studied digital addiction using a randomised experiment where some people were paid to reduce their social media usage for three weeks. <sup>45</sup> They found that these temporary incentives had permanent effects on usage, suggesting that social media consumption is habit forming. They also found that allowing users to set limits on their future screen time substantially reduced use. They suggested that self-control problems were responsible for 31% of social media use.

### There is evidence that social media platforms give some people news diets which are narrow and contain misinformation

Recent research, which looks directly at people's news diets, shows that news diets delivered by social media are more segregated than news delivered by other means.<sup>46</sup>

Levy (2021) found that news consumed through social media is more segregated than news accessed through other channels. <sup>47</sup> Levy also conducted an experiment which indicated that Facebook's recommender system was less likely to show 'counter-attitudinal' news than like-minded news to users. González-Bailón et al. (2023) found substantial levels of news segregation on Facebook around the time of the US presidential election in 2020. <sup>48</sup> This study found a high share of news items shared on Facebook were viewed by an audience which was either mostly conservative or mostly liberal, in contrast news items which were viewed by both conservatives and liberals in equal measure were relatively rare. This study also found that news sites which contained misinformation were for the most part sites with an overwhelmingly conservative audience.

We carried out our own research to examine people's news diets when using online intermediaries to access news and how this compares to people that go directly to news websites (See **Annex 2**). This analysis finds that people who are more reliant on social media or search for their news get a news diet that is focused on a narrower range of topics when compared to people that go direct to news websites.

This analysis uses a new technique which looks directly at the text of individual news headlines of articles that people have read to identify the topics that are covered in their news diet. The analysis has three main steps:

- We used Ipsos Iris web tracking data to identify news articles, from a selection of news websites, which had been visited by a sample of 8,600 people in 2021.
- We then used the sequence of website visits to identify whether the individuals had navigated directly to the homepage of the news website or arrived at the news article via an online intermediary.

<sup>46</sup> In a highly segregated news environment people are less likely to see news with the same political viewpoint (i.e., there will be a greater difference in the political slant of news seen by two randomly chosen individuals).

<sup>&</sup>lt;sup>45</sup>Allcott, Gentzkow and Song, 2022, <u>Digital Addiction</u>, American Economic Review.

<sup>&</sup>lt;sup>47</sup> Levy, 2021, <u>Social Media News Consumption</u>, and <u>Polarization</u>: <u>Evidence from a Field Experiment</u>, American Economic Review.

<sup>&</sup>lt;sup>48</sup> González-Bailón et al., 2023, <u>Asymmetric ideological segregation in exposure to political news on Facebook,</u> Science.

 We analysed the content of the headline of each article, to identify the topic of each article, using natural language processing.

This research finds that the news consumed by people who are more reliant on online intermediaries is more diverse in terms of the range of news *outlets* that people see. This finding matches the pattern found in other studies that measure the range of outlets visited.<sup>49</sup> However, we found a different pattern in the diversity of people's news diets in terms of the *topics* they saw. People who are more reliant on social media and search for their news get a news diet that is less diverse in terms of the range of topics they are exposed to. These findings are also consistent with concerns about the potential impact of social media in creating echo chambers, in which their users are exposed to a narrow range of views and topics.<sup>50</sup>

#### People's trust and perceptions of quality is lower for news on social media

As part of our regular News Consumption Survey, we ask people to assess the news they consume. This data shows that news sourced via social media is rated lower for trust (40%), accuracy (40%) and impartiality (40%) when compared to more traditional sources such as television news (trust (69%), accuracy (70%) and impartiality (63%))<sup>51</sup>. The lowest ranked news sources are social media platforms (Facebook, Instagram, Snapchat, YouTube, TikTok and X (formerly Twitter)). However, younger users, aged 16-24, are more likely to rate social media higher for quality, accuracy, and impartiality (**Figure 6**).

This builds on the findings in our 2022 Discussion Document which noted that people who most often use social media to access news are less likely to correctly identify important factual information, feel more antipathy towards people who hold different political views and are less trusting of democratic institutions, than people who use TV and newspapers most often as a source of news.<sup>52</sup>

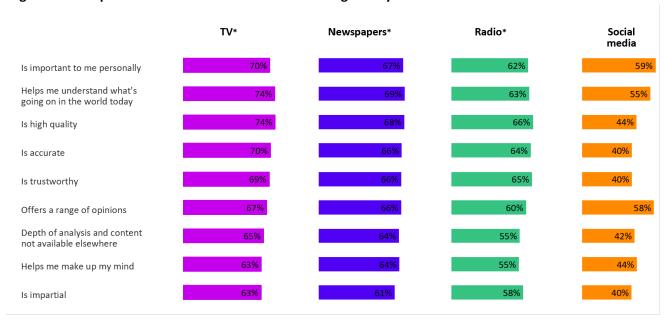
<sup>&</sup>lt;sup>49</sup> See for example: Fletcher, Kalogeropoulos and Nielsen, 2021, <u>More diverse, more politically varied: How social media, search engines and aggregators shape news repertoires in the United Kingdom, New Media & Society.</u>

<sup>&</sup>lt;sup>50</sup> <u>Discussion Document</u>, 2022, pp. 29-31.

<sup>&</sup>lt;sup>51</sup> News Consumption Survey, 2023.

<sup>&</sup>lt;sup>52</sup> <u>Discussion Document</u>, 2022.

Figure 6. Main platforms used for news and attributes given by users



Source: Ofcom, 2023, News Consumption Survey. 53

### Impacts on news publishers

### Changing consumption patterns have had a big impact on the business models of many news publishers

News publishers earn a return on their investment in the news they create in different ways depending on the way their readers or viewers access their content. Where people access news via a newspaper or TV news bulletin, the news publisher can monetise content through its direct relationships with readers and advertisers. Where people directly use the news website or app to access news, the publisher can charge subscriptions or solicit donations from its users directly. News publishers can also sell digital advertising space to firms that would like to attract the attention of their users. Where people access news via an online intermediary instead, it will be the intermediary, in the first instance, which monetises the content via its relationship with its user and with advertisers. To monetise content accessed via intermediaries, the news publisher must negotiate a fee with the intermediary for the use of its content.

Overall, the newspaper industry has seen a large decline in industry revenue as print circulation and related revenues have declined significantly, while digital revenues have not grown to replace those lost ones.<sup>54</sup> News publishers have therefore become increasingly reliant on other sources of income.

-

<sup>&</sup>lt;sup>53</sup> COMBINED F2F & ONLINE sample. Question: E2. How important is <BRAND> as a source of news to you personally? E3. And to what extent do you think the following statements apply to <BRAND> as a news source? Answer using a scale of 1 to 10. Base: All ratings by those using each platform for news at least weekly (every 2-3 weeks for weekly newspapers/mags) 2023 – TV=8107, Newspapers=2536, Radio=2380, Social media=3686. \*Television, Newspaper and Radio figures include offline usage only.

<sup>&</sup>lt;sup>54</sup> See for instance: <u>Discussion Document</u>, 2022, Ofcom and CMA, 2021, <u>Platforms and content providers</u>, <u>including news publishers</u>. <u>Advice to DCMS on the application of a code of conduct</u> ('Joint Ofcom and CMA report, 2021').

### News publishers face significant challenges as a result of the move to digital

Many news publishers have said that they face an imbalance in bargaining power when dealing with large platforms such as Google and Facebook and that this makes it difficult for them to secure fair terms for the use of their content. <sup>55</sup> This issue has led to implementation of news media bargaining codes in Australia and Canada. Further, the Digital Markets Competition and Consumer Bill (DMCC) in the UK will empower the CMA to require firms with 'strategic market status' in relation to a digital activity to offer fair and reasonable payment terms (including in relation to news content) in certain circumstances. <sup>56</sup>

Google is an important provider of services that enable news publishers to sell their digital advertising space via the open display advertising market. In 2020, the CMA found that Google holds a strong position at each stage of the intermediation chain, particularly as a publisher ad server<sup>57</sup> and that intermediaries capture, on average, at least 35% of the value of advertising bought through the open display channel (which is the type of online advertising news publishers typically provide). The CMA concluded that weak competition in digital advertising undermines the ability of newspapers and others to produce valuable content. <sup>58</sup>

Digitisation of news has led to other structural problems for news publishers. News faces more competition than ever for our attention. Where news is delivered as a post on a social media service newsrooms have a more distant relationship with their readers. They can find it more difficult to access data on their readers, more difficult to bundle content together, and it can be more difficult for them to maintain a strong brand.

As highlighted by the Media Pluralism Monitor UK report, the move to digital could be detrimental for the overall plurality of the UK media market.<sup>59</sup> There will also be new challenges on the horizon for news publishers as AI becomes more widespread throughout the economy. AI may provide opportunities for news publishers. For example, it can support content creation across various media, including generating news articles, essays, web pages, marketing copy, social media posts, pictures, audio, and video.<sup>60</sup> It can be also used to tailor content more efficiently, for instance some broadcasters have been using AI for several years to streamline content generation or power recommendations on their video on demand platforms.<sup>61</sup>

Advanced forms of AI, however, also present new challenges for news distribution, discovery and access through online intermediaries as they are increasingly used in content moderation and curation processes. <sup>62</sup> There is early evidence that the use of these technologies in certain cases may

<sup>&</sup>lt;sup>55</sup> For a more detailed discussion see: Joint Ofcom and CMA report, 2021.

<sup>&</sup>lt;sup>56</sup> At the time of writing, the DMCC Bill is currently going through the legislative process. For more information see: CMA, 2024, <u>Overview of the CMA's provisional approach to implement the new Digital Markets competition regime</u>.

<sup>&</sup>lt;sup>57</sup> A publisher ad server manages the publisher's advertising inventory and is used to make the final choice of which ad to serve, based on real time bids and bilateral deals. The CMA found Google had a share of over 90% of ad servers in 2019.

<sup>&</sup>lt;sup>58</sup> CMA, 2020, Online platforms and digital advertising: Market study final report.

<sup>&</sup>lt;sup>59</sup> Tambini and Madrazo, 2023, <u>Using the Media Pluralism Monitor to Assess Media Pluralism in the UK in the Year 2022</u>.

<sup>&</sup>lt;sup>60</sup> Ofcom, 2024, Future Technology and Media Literacy: Understanding Generative AI, ('Media literacy, 2024').

<sup>&</sup>lt;sup>61</sup> Ofcom, 2023, <u>Ofcom submission of evidence to the House of Commons Science, Innovation and Technology Committee's inquiry into the governance of artificial intelligence</u>, ('House of Commons submission, 2023').

<sup>&</sup>lt;sup>62</sup> Cambridge Consultants, 2019, <u>Use of AI in online content moderation</u>.

lead to new harms or may exacerbate existing ones in the news sector. 63 For instance, AI could facilitate the creation and dissemination of 'fake' content in news and media which can increase the risk of exposing people to mis- and dis-information online. 64

The use of AI and GenAI by online intermediaries could also further exacerbate disintermediation, especially as social media and search engines increasingly integrate GenAI capabilities in their services. 65 For example, search engines with integrated GenAI can provide summaries of live search results from across the web, further curating the presentation of news content on their services and potentially disincentivising readers to go directly to the news website. The unauthorised use of copyright works without payment to train AI models (including to produce news-like content on GenAl chatbots) has also created further frictions between publishers and platforms, <sup>66</sup> and further demonstrates the increasing role of online intermediaries in news production.

#### There has been a period of innovation as news publishers have experimented with different ways to earn a return online

News publishers have a variety of different strategies for growing their revenues online. Some titles have adopted a 'free to reader' strategy with revenues based on digital advertising. Other titles have opted for an approach based on subscriptions or other reader payments with a variety of innovative pricing approaches.<sup>67</sup> Recent studies indicate that news publishers have had some success at growing user payment revenues. In addition, several titles have sought to grow their presence in other countries. For example, the MailOnline has a well-established readership in the USA and the Guardian has established readerships in the USA, Australia, and Canada. 68

<sup>&</sup>lt;sup>63</sup> House of Lords submission, 2024.

<sup>&</sup>lt;sup>64</sup> See for instance: <u>House of Commons submission</u>, 2023; and Hsu and Thompson, 2023, <u>Disinformation</u> Researchers Raise Alarms About A.I. Chatbots, The New York Times.

<sup>65</sup> Media literacy, 2024.

<sup>&</sup>lt;sup>66</sup> See for instance: Gyrnbaum and Mac, 2023, <u>The Times Sues OpenAI and Microsoft Over A.I. Use of</u> Copyrighted Work, The New York Times (behind paywall).

<sup>&</sup>lt;sup>67</sup> See for instance: Enders Analysis, 2024, <u>UK National News Industry: Green Shoots of Recovery</u>; Jenkins and Nielsen, 2018, The Digital Transition of Local News; Cairncross Review, 2019, The Cairncross Review: a sustainable future for journalism.

<sup>&</sup>lt;sup>68</sup> Enders Analysis, 2024, <u>UK National News Industry: Green Shoots of Recovery.</u>

# Designing interventions is a complex task

Our new qualitative research and new evidence from academic studies has explored whether it would be possible to make changes to news feeds (as currently structured) in order to improve the breadth and quality of news and the diversity of viewpoints seen by social media users. These studies however show that designing new interventions is a complex task with mixed results.

# People's ability to control their newsfeed is limited and existing interventions are not user-friendly

In our new qualitative research (See **Annex 3**), we tested some potential interventions that we considered could have had a positive impact on people's news diets, inspired by the existing literature. The first (Cohort 1) encouraged those with low PSB news consumption to follow PSB sources online. The second (Cohort 2) recruited people with self-declared left- or right-wing attitudes to follow counter-attitudinal news sources. The third and fourth cohorts recruited people who consume news from a range of non-mainstream/alternative news sources and asked them to either review the sources of news they followed online (Cohort 3) or use a browser extension which offered trust scores for news sources (Cohort 4).

By blending qualitative interviews with passive observations, the study explored how user behaviours changed (or did not) in response to these interventions. It should be noted that this was a small-scale qualitative research project, and this analysis is purely exploratory. Any 'effects' that we describe were found at the participant-level. This work was originally intended as a companion to a larger-scale quantitative field trial to investigate these issues more fully. However, the quantitative study was not feasible without working in partnership with a social media platform. As such the results are not generalisable to a larger population.

Overall, our findings suggest that trying to design interventions to improve the breadth and balance of news consumed on social media is a complex task. Its impacts on experiences can be varied and unexpected. The research also shows that there were limitations to the extent that people could influence and control their own news feeds. When participants made changes, they did not always have a noticeable effect on their newsfeed. For instance, Cohort 1 demonstrated that the impact of following PSBs appeared to have variable impact on the amount of PSB content delivered on the newsfeeds (see **Annex 3**). Participants who saw more 'counter-attitudinal' news as a result of the 'treatment' reported this was mostly through comments sections rather than in their feeds (Cohort 2).

However, participants did generally engage in the process of following alternative news sources, be that PSB or counter-attitudinal news, and as a result of the treatment, participants reflected more critically about the possibility of bias in their existing news sources on Facebook. Some participants

found the news sources not to their taste, or that the news sources reinforced negative perceptions and entrenched existing views.

"Comparing the way some pages showed news stories compared to sources like the BBC and ITV, did make me think a bit about how I currently get my news."

Male, 18-34, Cohort 1

"Even though I vote Conservative I don't just want their views on my timeline. I find it really useful to know what different sides are saying about the main issues."

Female, 55+, Cohort 2

The study also highlighted that the function that enabled editing of newsfeed choices was not user-friendly, and many people struggled to use it effectively (Cohort 3). However, by reviewing the news pages and accounts followed, many participants felt more empowered by enabling active control over some of the content they receive on their newsfeed.<sup>69</sup>

The use of 'trust scores' for news outlets also had mixed results with limited effects on participants' news diets (Cohort 4). Trust scores mostly validated participants' existing range of trusted sources. Apart from a few isolated cases, participants did not change which news sources they followed as a result of trust scores, or the frequency they used them. Furthermore, in general attitudes towards trust in news on Facebook and news publishers were mixed and there were only minor changes in how participants felt towards people with different perspectives.

## New academic research shows that designing effective interventions is difficult

There have been several important, novel studies published in the academic literature that shed new light on how interventions can affect the news people get from social media and how this affects social media users. In particular, three new field trials were published in 2023 as part of a project where Meta collaborated with independent academics over the 2020 US election period. <sup>70</sup> Meta gave researchers access to its Facebook and Instagram platforms, allowing them to conduct large scale field experiments of service changes and collect data on how these changes affected its users. Three experimental studies have been published to date: <sup>71</sup>

• Nyhan et al (2023) conducted a field trial where a sample of Facebook users were given a content feed where 'like-minded' content had been down weighted within the ranking strategy of the recommender system. 72 The effect of this treatment was to reduce the proportion of the feed that was made up of like-minded content from around 54% to around 36% and to increase the amount of neutral and 'cross-cutting' content in the feed. These changes had no measurable effects on eight preregistered attitudinal measures such as

\_

<sup>&</sup>lt;sup>69</sup> Annex 3, 2024.

<sup>&</sup>lt;sup>70</sup> For further information on the partnership between Meta and the researchers involved in this project see: Meta, 2024, Research partnership to understand Facebook and Instagram's role in the U.S. 2020 election.

<sup>&</sup>lt;sup>71</sup> These studies were published alongside González-Bailón et al. (2023) as the first four of an expected series of 16 papers to result from this project.

<sup>&</sup>lt;sup>72</sup> Nyhan et al., 2023, Like-minded sources on Facebook are prevalent but not polarising, Nature.

- affective polarisation i.e., the extent of dislike for the opposing group, ideological extremity, candidate evaluations and belief in false claims.
- Guess et al (2023a) assigned a sample of consenting Facebook and Instagram users to reverse-chronologically-ordered feeds instead of the default recommender system. The chronological feed affected exposure to content, increasing the amount of political and untrustworthy content on both platforms, decreasing the amount of content classified as 'uncivil' or containing 'slur words' on Facebook, and increasing the amount of content from ideologically moderate friends and sources with ideologically mixed audiences on Facebook. Following these changes in users' on-platform experience, the chronological feed did not significantly alter levels of issue polarisation i.e., the extent of difference in political views or issue positions, affective polarization, political knowledge, or other key attitudes during the three-month study period.
- Guess et al (2023b) studied the effects of exposure to reshared content on Facebook during the 2020 US election by assigning a random set of consenting, US-based users to feeds that did not contain any reshares over a three-month period.<sup>74</sup> This treatment substantially decreased the amount of political news (including content from untrustworthy sources) to which users were exposed; decreased overall clicks and reactions; and reduced partisan news clicks. Removing reshared content produced clear decreases in news knowledge within the sample, although there is some uncertainty about how this would generalise to all users. The treatment did not significantly affect political polarisation or any measure of individual-level political attitudes.

The interventions in these experiments were relatively short lived and so are perhaps most informative about short term interventions rather than permanent changes in how a social media platform works, or the cumulative effects of many years of exposure. The timing of the experiments was also somewhat unique, in that they took place around the 2020 US election at a time when citizens were heavily exposed to political messaging from many different channels. In some cases, interventions had a mix of 'good' and 'bad' effects on users' newsfeeds, for example the reverse chronological feed experiment resulted in reduced exposure to uncivil content but increased exposure to untrustworthy sources on Facebook. Other interventions may have more consistent effects on user news feeds and may have more success at changing outcomes such as polarisation.

Nonetheless, these studies highlight the importance of testing any service changes before implementation as they can have surprising effects. They also illustrate the complexity and difficulty of managing recommender systems that shape the newsfeeds and of designing changes to social media platforms to improve news diets and outcomes such as polarisation.

<sup>&</sup>lt;sup>73</sup> Guess et al., 2023, <u>How do social media feed algorithms affect attitudes and behavior in an election campaign?</u>, Science ('Guess et al., 2023').

<sup>&</sup>lt;sup>74</sup> Guess et al., 2023.