

## How Do Intermediaries Shape News-Related Media Repertoires and Practices? Findings From a Qualitative Study

JAN-HINRIK SCHMIDT<sup>1</sup>

LISA MERTEN

UWE HASEBRINK

ISABELLE PETRICH

AMELIE ROLFS

Leibniz Institute for Media Research  
Hans-Bredow-Institut (HBI), Germany

Online intermediaries such as search engines, social network sites, or video platforms provide access to diverse content; however, there is a school of thought that argues that they may also contribute to the structural deformation of the public sphere. To assess the impact of these Web-based services, research needs to address them not as isolated platforms but as part of broader media environments. Based on 6 group discussions and 18 interviews with German participants varying in age and political engagement, we mapped individual information repertoires with a particular focus on online intermediaries, reconstructed key episodes in which these services were used for gathering information on current news events, and investigated participants' awareness of the architecture and mechanisms of these intermediaries. Findings show that for most participants, online intermediaries are an indispensable part of their media repertoires, but are seldom dominant, let alone the only source of information on political topics. Most respondents possessed some knowledge on the basic workings of the intermediaries they used, but were not familiar with details such as algorithmic personalization.

*Keywords: media repertoires, informational practices, intermediaries, qualitative research*

---

Jan-Hinrik Schmidt: j.schmidt@hans-bredow-institut.de

Lisa Merten: l.merten@hans-bredow-institut.de

Uwe Hasebrink: u.hasebrink@hans-bredow-institut.de

Isabelle Petrich: i.petrich@posteo.de

Amelie Rolfs: a.rolfs@posteo.de

Date submitted: 2018-03-09

<sup>1</sup> This work was supported by the Medienanstalten, the network of German state media authorities. The authors would like to thank all interviewees for their participation, two anonymous reviewers for their valuable and constructive remarks, and Marc Kushin for proofreading.

Copyright © 2019 (Jan-Hinrik Schmidt, Lisa Merten, Uwe Hasebrink, Isabelle Petrich, and Amelie Rolfs). Licensed under the Creative Commons Attribution Non-commercial No Derivatives (by-nc-nd). Available at <http://ijoc.org>.

Luisa, a young woman of 17 years, is a regular visitor to YouTube, where she gathers information on topics she cares about. One day, her mother recommended a video documentary on climate change, which had been produced by the Franco-German public service broadcaster ARTE. In the algorithmic recommendations connected to that video, she discovered another educational video arguing that there is no such thing as human-made climate change. Luisa, who heads the local youth group of an environmental NGO, was confused: "Well, you don't really know what to believe, because some information looks good or trustworthy, although I don't understand everything. It is very hard to tell facts and fiction apart."

When Jasmin, a 22-year-old trainee in a large company, left work in the early evening of July 22, 2016, a push notification on her smartphone informs her of a violent rampage taking place in Munich. At home, she switched on her television to follow the news and used WhatsApp and Facebook as a "second screen" to check the safety of her friends and acquaintances in the Munich region. On Facebook, she came across an eyewitness video of the shooting and injured people: "I saw that on TV as well, but on Facebook literally thousands of people shared and liked the video. . . . It was just there."

Dieter is 54 years old and an active member of an NGO that deals with issues related to transportation and mobility. He considers Google an important tool for keeping up with information on topics that he is interested in. But he strongly disapproves of Google's monopoly and criticizes other Internet companies as well, even when they can help him spread his political positions: "No, I don't want to share anything on Facebook or Twitter, because they are undemocratic companies with their own particular agenda."

These vignettes, collected from in-depth qualitative interviews, exemplify a conclusion that other studies have drawn before: Online intermediaries such as search engines, social network sites, or video platforms are central to the contemporary digital public sphere. They provide access to a broad variety of content, from professional media outlets through strategic communication by celebrities, brands, companies, political parties and initiatives, to more personal musings from friends and family. At the same time, they complicate practices of information management and opinion formation as they raise issues of trust and power over the spread of (mis)information, articulated, for example, in recent debates on the prevalence of "social bots" (Bessi & Ferrara, 2016) and "fake news" (Tandoc, Lim, & Ling, 2018; Vargo, Guo, & Amazeen, 2017). Although their functionalities and affordances differ, online intermediaries share three basic characteristics:

1. They support the simultaneous debundling and rebundling of content. Intermediaries present news, videos, and status updates, unlike traditional publications where content comes in discrete bundles with a temporal rhythm (the "news broadcast" or "newspaper edition"). Rather, they produce constantly updated "streams," "feeds," or instantaneous lists of search results. Instead of editorial curation, inclusion and exclusion of content in these new information bundles is based on algorithmic selection, such as calculations of relevance for a search term, proximity within a social graph, or alignment with users' preferences.

2. This particular kind of “algorithmic media production” (Napoli, 2014) fosters the personalization of information diets. This can be the consequence of intentional practices, such as when people add other users to their contacts or subscribe to video channels, yet many instances of personalization occur without a user’s intention, insofar as intermediaries use filter and recommendation systems that draw on previous activities and metadata to hide or promote certain information.
3. Online intermediaries (with the notable exception of search engines) assist follow-up-communication on published information by providing functionalities for easy commenting, sharing or rating content, as well as making the aggregated results of these practices visible to other users. These affordances not only foster the dynamic, sometimes viral, spread of information within social networks but also provide new indicators for the popularity or impact of certain information.

Through these characteristics, intermediaries shape contemporary information flows and subsequent practices of opinion formation on topics of collective relevance. The U.S. presidential election and the Brexit referendum in 2016, as well as the national elections in France and Germany in 2017, were culmination points for debates on the influence intermediaries have on political debates and decisions (e.g., Allcott & Gentzkow, 2017; Ferrara, 2017; Howard & Kollany, 2016). A growing number of academic studies now provides empirical evidence; however, their conclusions vary. On the one hand, there are studies that argue that intermediaries support “inadvertent exposure” (Brundidge, 2010, p. 695), “incidental exposure” (Fletcher & Nielsen, 2018, p. 2452), or “ambient journalism” (Hermida, 2010, p. 297)—that is, unplanned exposure to various topics and information. This, in turn, can increase not only a sense of being informed (Müller, Schneiders, & Schäfer, 2016) but also the level of knowledge on news topics (Bode, 2016). Trust in information found on social media is high if it is shared among social ties, especially by perceived opinion leaders (Turcotte, York, Irving, Scholl, & Pingree, 2015). Social media can also provide “situational awareness” (Vieweg, Hughes, Starbird, & Palen, 2010, p. 1079) in crisis situations such as natural disasters or terrorist attacks, when people are looking for information on their friends and family, which they cannot find in regular journalistic coverage (Bruns & Burgess, 2014).

On the other hand, there are fears that intermediaries foster structural deformations and constrictions of digital public spheres, such as “filter bubbles” (Pariser, 2011) and “echo chambers” (Garrett, 2009), whereby people are no longer exposed to various topics and perspectives but remain within fragmented and polarized clusters of worldviews and opinions. Empirical evidence suggests that some groups do actually form such isolated clusters—for example, conspiracy theorists (Del Vicario et al., 2016; Mocanu, Rossi, Zhang, Karsai, & Quattrociocchi, 2015) or far-right, Islamophobic movements (Ernst, Engesser, Büchel, Blassnig, & Esser, 2017; Stier, Posch, Bleier, & Strohmaier, 2017). But other studies argue that, overall, most users of intermediaries are exposed to both “cross-cutting discussions” and “like-minded discussions” (Heatherly, Lu, & Lee, 2017; see also Flaxman, Goel, & Rao, 2016; Vaccari et al., 2016).

An important lesson from previous research is that intermediaries cannot be assessed in isolation, but rather they should be analyzed in wider contexts, in at least two respects: First, because intermediaries are usually not the only outlet where users get information on current events of broader relevance, studies on

their impact need to take the broader media repertoires of citizens into account (Boczkowski, Matassi, & Mitchelstein, 2018; Dubois & Blank, 2018; Fletcher & Nielsen, 2017). Second, news-related information management and subsequent opinion formation are performed within particular “communicative figurations” (Hasebrink & Hepp, 2017)—that is, within particular actor constellations that share a frame of relevance and employ certain media ensembles and communicative practices. This has been shown, for example, in studies of family communication on news (Edgerly, Thorson, Thorson, Vraga, & Bode, 2017; Shehata, 2016), on news sharing and (incidental) news exposure through friends on social networking sites (Kümpel, Karnowski, Keyling, & Kümpel, 2015; Lee & Ma, 2012) or on the informational networks of “offliners” (Dutton & Blank, 2013).

General methodological difficulties of measuring media effects aside, several characteristics of online intermediaries further complicate attempts to assess their consequences. A central problem for academic research is that access to data on actual patterns of information exposure via intermediaries is usually limited (Halford, Weal, Tinati, Carr, & Pope, 2018; Puschmann & Burgess, 2014). Academic research is, therefore, at a disadvantage compared with the research divisions within companies such as Google or Facebook (e.g., Bakshy, Messing, & Adamic, 2015). In addition, the landscape of online intermediaries is in constant flux with respect to both the structure and business models of the industry (e.g., Albarran, 2013) as well as to their key technological features such as algorithms, interfaces, and apps (e.g., Covington, Adams, & Sargin, 2016; Gerlitz & Helmond, 2013; Wilken, 2018). For example, in the first few months of 2018, Facebook changed its News Feed algorithm to prioritize posts from friends and family over public content from politicians or media organizations (Mosseri, 2018) and restricted which information can be accessed via their API (Archibong, 2018). These dynamics not only impede research but also make it harder for users to arrive at stable mental models of how these intermediaries work and how the flow of content and data is structured. Several studies have shown, for example, that there is only a limited amount of “algorithm awareness” among users (i.e., only slight knowledge on which parameters and general mechanisms are behind the Facebook News Feed; Eslami et al., 2016; Rader & Gray, 2015). Nevertheless, people form individual conceptions and folk theories of these algorithmic systems that frame their use (e.g., Bucher, 2017; DeVito, Gergle, & Birnholtz, 2017).

Given the potentially far-reaching effects of online intermediaries on contemporary public spheres and on shared practices of information management, as well as the methodological difficulties in assessing them, the remainder of this article is focused on three interrelated questions:

- RQ1: Where do different user groups position online intermediaries within their media repertoires on news and events of broader relevance?*
- RQ2: How do users include online intermediaries and their content within specific practices of news-related information behavior?*
- RQ3: How knowledgeable are users on the algorithmic selection processes of online intermediaries, and to what extent does such (non)knowledge go hand in hand with certain degrees of reflected use of online intermediaries?*

The next section of this article describes the empirical design of a qualitative study, followed by two sections on main findings and a section with conclusions drawn from the research project.

### Study Design

The study was commissioned by the German network of state media authorities<sup>2</sup> and conducted between March 2016 and February 2017. Three conceptual decisions shaped its empirical design. First, it focused on four types of intermediaries that were most prevalent among German Internet users at the time of the study (Newman, Fletcher, Levy, & Nielsen, 2016): search engines, social network sites, photo and video platforms, and instant messaging services. Other social media, most notably blogs, Twitter, and Wikipedia, were not central to the research, although they were occasionally mentioned during some of the interviews.

Second, to acknowledge the contextualized nature of intermediaries and study them as part of users' broader communicative figurations, we decided to recruit preexisting social groups instead of forming ad hoc focus groups of participants who had never met before (see Swart, Peters, & Broersma, 2018, for a similar approach). To increase the variance in group selection, we varied two characteristics that have been shown to have an influence on intermediary use: (1) In line with findings that the adoption and frequency of intermediary use differ with age (e.g., Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2018), we selected groups consisting of teenagers, young adults, and adults, respectively. (2) Based on findings that information seeking on social media is positively correlated with civic and political participation (e.g., Gil de Zúñiga, Jung, & Valenzuela, 2012), we compared groups where the main purpose is political engagement with those where it is not.<sup>3</sup> This resulted in a final selection of six groups (see Table 1), which were recruited within the Hamburg region.

**Table 1. Recruitment Plan.**

Age	Teenagers (14–20 years)	Young Adults (20–30 years)	Adults (30–70 years)
Political engagement	Youth group of environmental NGO	Trainee council of large company	Local chapter of NGO (transportation/mobility)
. . . is group focus			
. . . is not group focus	Teenage friends	Soccer fan club	Group of friends (early retirees)

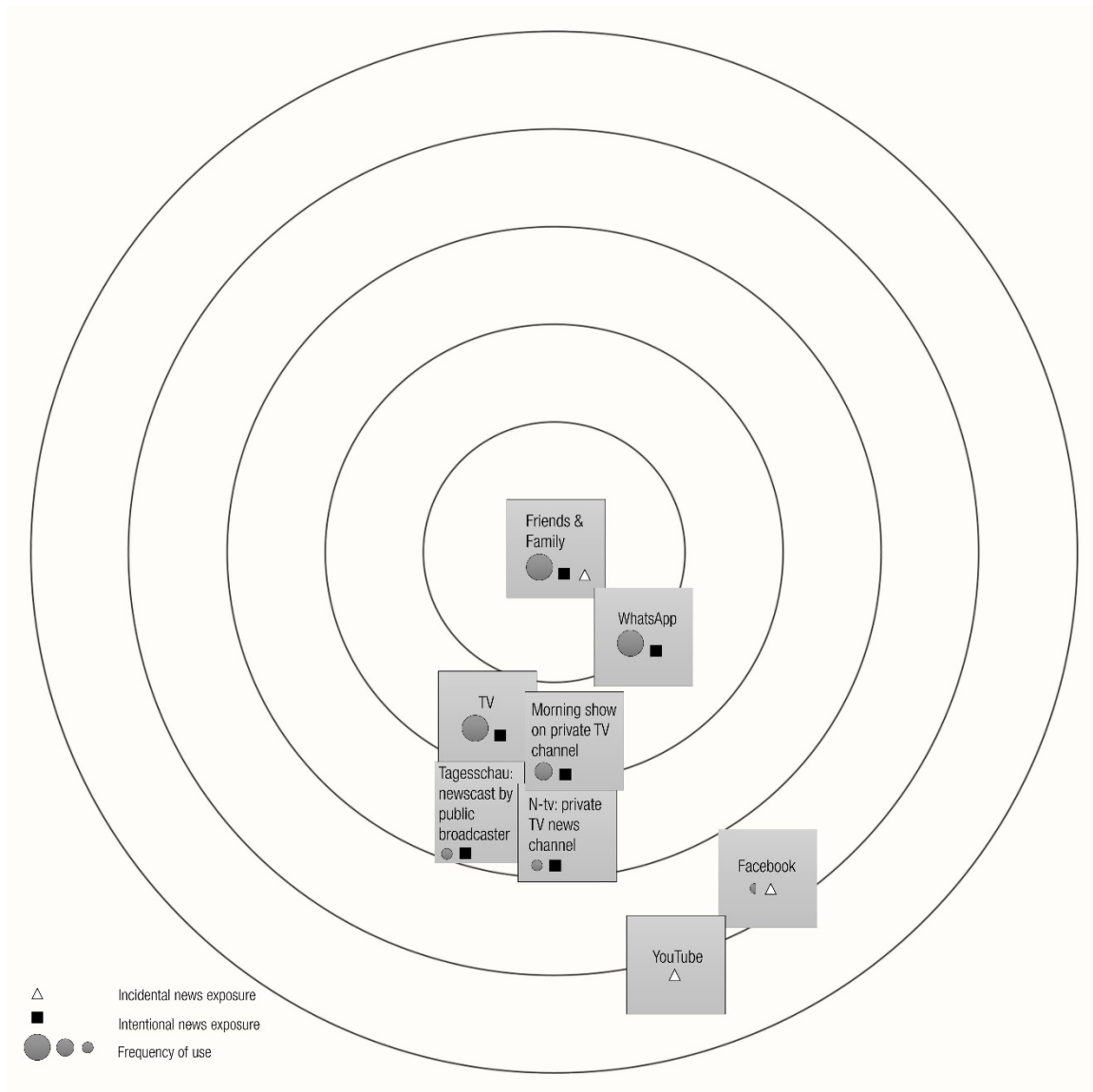
<sup>2</sup> As part of their responsibilities in the German media system, the 14 state media authorities regularly commission independent academic research to inform debate on media regulation. This study had been designed in response to an open call for research proposals on Online Intermediaries and Opinion Formation; the scope of the proposals was limited to qualitative projects and should focus on the four most prominent types of intermediaries. Its final report has been published in German as Schmidt, Merten, Hasebrink, Petrich, and Rolfs (2017).

<sup>3</sup> Ultimately, we did not observe substantive differences between those groups with a focus on political engagement and those that had a different group focus. Although this might be a result of our sampling, it also points to the fact that news interest is of course not restricted to groups with a formal focus on political engagement.

Third, we chose to employ a combination of qualitative methods to reconstruct the communicative figurations—that is, the actor constellations, media repertoires, and informational practices for each group and the individuals belonging to them. We conducted six semistructured group discussions with four to six members of each group (overall  $n = 27$ ). The aim of these discussions was to explore the role of intermediaries and their content within group-specific practices and networks of news-related behavior. The discussion guideline centered around three subsequent tasks: assessing the importance of intermediaries in group communication; evaluating individual platforms in terms of attachment to, trust in, and the credibility of the information found there; and reconstructing an exemplary episode of news-related information seeking and opinion formation within the group. The discussions took place between June 10 and August 18, 2016, and lasted approximately 90 minutes each.

After the group discussions, follow-up in-depth interviews with three members of each group ( $n = 18$ ; taking place between June 29 and August 26, 2016) sought to understand the subjective meaning users attach to different media sources and to place practices in the context of everyday media use, both within and beyond the group. The interview guideline included two subsequent tasks: (1) Reconstructing and visualizing the media repertoire of the person by means of card sorting. Participants received Post-it notes to write down all their sources of information on socially relevant events and topics. Next, they placed these notes on a large sheet adorned with several concentric circles, positioning the sources more important to their repertoire closer to the center of the board (see Figure 1 for an exemplary visualization). During this exercise, the interviewer continually asked participants to reflect on issues such as importance, frequency of use, and the credibility of the different sources, specifically those that were connected to different intermediaries (for a thorough methodological discussion of this approach, see Merten, 2017). (2) Gaining insight into actual practices of intermediary use. Participants were asked to demonstrate (either on their mobile device or on the interviewer's laptop) and explain in real time their personal setup of certain platforms or typical episodes of use (e.g., browsing the Facebook News Feed or conducting a Google search). These situations provided us with another opportunity to reflect on the purpose and the importance of particular platforms for each participant.

All group and individual interviews were transcribed and analyzed in three steps. First, trained student assistants coded each transcript in MaxQDA according to a predefined coding scheme. Second, based on these codings and the transcripts, the interview team (lead interviewer and assistant) wrote a portrait of each group and individual that summarized the main aspects of the interview following a fixed structure. As a third and final step, the whole team (three researchers and two student assistants) gathered for a two-day workshop to jointly answer the research questions based on all available material (portraits, codings, and transcripts).



**Figure 1. Exemplary visualization of a media repertoire (Daniel, 23 years, trainee council).**

### Media Repertoires and News-Related Practices

The positioning of online intermediaries in media repertoires and their inclusion in specific practices and networks of news-related information-seeking behavior differs greatly. The following section summarizes the findings for the four main types covered in the study.

### ***Search Engines***

Google is the dominant search engine for all age groups and is fully integrated into everyday Internet use. Users understand it as a tool, sometimes even as a synonym for the Internet, but not as a source in itself: "I don't consider a search engine as an information source, it is more of a tool—you search for something, then you click a link to a page, and there you have your answer" (Nele, 18, environmental youth group). More specifically, the participants see Google as a central node for the satisfaction of all kinds of information needs that may arise in a specific situation or when addressing a particular topic. As a result, they engage primarily in directed information search activities. Episodes of undirected use were mentioned by only a few participants who use Google News or Google Now to gain a general overview on current affairs.

As far as news on current events is concerned, a few participants made it clear that the list of search results already provides them with an initial orientation or direction as well as insight into the diversity of positions through numerous (also: journalistic) sources. Even when explicitly prompted by the interviewers, almost none of the participants noticed patterns of personalization based on previous search queries and algorithmic selection. Still, some were concerned about data collection and discussed how they might episodically switch to alternative search engines such as Ecosia or DuckDuckGo. However, the general consensus was that those alternatives provided a less satisfying search experience than Google. The participants perceived Google as omnipresent and superior, but also as a "data kraken" (Emma, 17, environmental youth group) or a "necessary evil" (Thomas, 49, transportation NGO).

### ***Social Network Sites***

Facebook is still the dominant social network site in Germany. Almost all respondents were at least familiar with the site, either through previous use or through observations of family members, friends, or colleagues, but regular Facebook users were found only among the two groups of young adults (20–30 years). While they all reported to have at least some exposure to news outlets on the site, only two information-savvy members of the soccer fan club, David (27) and Fabian (25), mentioned strategies of active curation and customization of information repertoires on Facebook, including traditional journalistic sources as well as niche interests or counterpublics, without being prompted.<sup>4</sup> David even maintains two different Facebook profiles to tailor the platform more to his needs:

I now have one Facebook profile for communication only, for private communication in messages and so on. And one profile for information retrieval. This gives me a bit of hope I can (a) spread my usage patterns and make them anonymous and (b) trust the newsfeed a little bit more. (David, 27, soccer fan club)

In contrast, the other young adults did not consider Facebook to be a central element of their news-related repertoires and practices, and they stressed its predominant purpose as a tool or space to maintain social contacts. Indirectly, however, this can have an effect on perceptions of current events because the

---

<sup>4</sup> Our interviews were conducted before the change in Facebook's News Feed algorithm which currently prioritizes updates from friends and family over public contacts (Mosseri, 2018).



architecture of Facebook's News Feed affords the constant monitoring of current developments. During times of crisis—a terrorist incident, for example—it provides information on the safety of friends or family, which cannot be provided by traditional news media. Some participants described how they only learned about certain news events because Facebook activated the Safety Check feature for a certain region. For example, David (27, soccer fan club) remembered that even though he had already heard about the 2016 Turkish coup d'état attempt through other channels, he only realized that "there was something bigger going on" when the Safety Check feature started to appear in his feed.

As far as comments were concerned, many respondents who use Facebook acknowledged that it makes the distribution of other opinions (both "minority" and "majority opinions") visible. However, almost all of them hold a very negative view of comments on public Facebook pages ("a war zone," as Daniel [23, trainee council] put it). In addition, various users articulated their dissatisfaction with the quality of content and Facebook's algorithmic sorting in general rather early on in the interviews, unprompted by interviewers' questions. Those who still use it reported that their social contacts tied them to the network: "I would love to get rid of Facebook, but in the end, it is a good tool for communication. Facebook is popular and everyone is on it" (Fabian, 25, soccer fan club). Participants who left Facebook for alternative platforms had mainly adopted WhatsApp for group communication and on occasion had switched to photo and video platforms such as Instagram. Three of those nonusers explicitly mentioned "proxy users" (Dutton & Blank, 2013, p. 54), friends or relatives who report important news from the platform or look up another user for them.

### ***Photo and Video Platforms***

The most popular intermediary in this category among our interviewees was YouTube, which almost all of them use. Only a few younger respondents have accounts on Instagram or Snapchat, but have not (yet) tapped into these services as a source of news. For example, Jasmin (22, trainee council) follows accounts that contain content on healthy food, animals, fitness, and fashion on Instagram: "I would say everything except politics." There were also general doubts about the usefulness of these services for content on current affairs: "Political topics have no space on Instagram; it is just the wrong platform" says Stefanie, another 22-year-old member from the trainee council.

Regarding YouTube, all respondents reported that they predominantly, but not solely, consume videos for entertainment (e.g., music, comedy, satire) and, in the main, have no interest in participating in discussions via the comments or in creating and uploading videos of their own. Nevertheless, two aspects of YouTube use that are relevant for news-related practices emerged from the interviews. First, our younger participants in particular mentioned a number of German News YouTubers (such as LeFloid or KenFM). They appreciate them, not primarily as a source of factual information but rather as an opportunity to learn about other people's opinions and arguments, and to form their own opinion on these grounds. But while Luisa (17, environmental youth group) regards the rather controversial channel KenFM as a source of diverse and differentiated perspectives on current events, David (27, soccer fan club) states that he watches

with a good mix of horror and wonder [at] classic conspiracy theorists such as KenFM, but really just to hear what the latest conspiracy shit is. . . . One always runs the risk of

coming across these opinions and arguments in discussions, and then it's quite good to have heard them before.

Second, participants such as Daniel (23, trainee council) or Thomas (49, transportation NGO) reported instances of unintended confrontation with political topics when their main motivation had, in fact, been to search for other information. Daniel, for example, explained that he occasionally comes across speeches by members of the German Bundestag ("But I don't open YouTube for that kind of thing"). Thomas mentioned an episode when he went to YouTube to prepare for an upcoming work trip to Croatia. Starting with the intention of learning about the history of the country, algorithmic recommendations led him to additional content on various other Balkan countries and their complicated political relationships. Generalizing such experiences, Thomas states, "I lose track on YouTube even more often than I do on Google: Where did I start? What did I search for in the beginning?"

So even when YouTube is not primarily used with the intention of gathering information on current affairs and events, it enables different modes of news-related use. Although both the reliance on the personal and at times controversial voices of popular YouTube channels, as well as the mode of browsing the platform, can broaden perspectives on certain issues, Luisa's experience cited in the introduction (as well as recent news reports; see Lewis, 2018) demonstrates that the YouTube recommendation algorithms can also point users to professionally produced propaganda and conspiracy theories. This can, in turn, lead to uncertainty or even deception.

### ***Instant Messaging Services***

WhatsApp and (in a few groups) Facebook Messenger are central means of maintaining social ties and exchanging information within the groups. Because they allow users to keep in touch with their respective peers and small-scale social contexts such as family, friends, and colleagues, they have substituted Facebook for many of our respondents who consider the social network site no longer suitable or attractive. Accordingly, users describe WhatsApp as "closer" and "more personal" than other intermediaries and do not consider it an adequate tool for news and journalism in general. (Interviewer): "Could you imagine adding Tagesschau or n-tv (German news outlets; authors' note) as WhatsApp contacts?" (Daniel, 23, trainee council): "Well, no. These are separate things for me. I mean, I don't want to deal with them in my private life."

Two notable exceptions were mentioned in the interviews. First, the members of the soccer fan club reported episodes of distributed information management, such as the collection and recommendation of information via Instant Messenger, which then helped the group's members to form an opinion. Lenia (30, soccer fan club), for example, talked about a situation where the fan club members debated whether or not to change their "home block" at the stadium after a sexist incident:

One of you guys had posted a link [on Facebook messenger] to a blog or something from the fan community where they covered this incident. . . . And our voting on whether or not to change fan blocks is conducted online at the moment.

Secondly, instant messaging can also become important in crisis situations when users have a strong desire to learn about the well-being of their friends and relatives or to forward information on the crisis to them. Talking about a mass shooting that took place in Munich a few days before the interview, Jasmin (22, trainee council) described how she used WhatsApp to distribute information to a close friend:

So I actually sat there those two, three hours in front of the TV and watched it completely. And a friend of mine was out and about. (Interviewer): In Munich? (Jasmin): No, in Hamburg, but still, among a crowd and many people. Somehow, I was afraid, and so I informed her via WhatsApp. And she said, "Give me news every time there is a press conference from the police, always update me." So that's where I get to inform others, especially when there is specific demand, because someone else may not even be able to inform themselves.

The group of teenage friends reported another episode that exemplified how instant messaging affords both practices—collaborative information sharing and keeping up with breaking news events—simultaneously and in conjunction with other media sources. On the evening of July 15, 2016, Jonas (14) learned from his stepmother about the breaking developments of the coup d'état in Turkey. He instantly went into TeamSpeak, the voice chat and instant messaging application that he and his friends use, and told them the news. Franz (15) continues: "And then we're all kind of looking for a live ticker. I think I followed the breaking news on ARD [public broadcaster] during Tatort [crime television series] that was still running at the time." Later that night, Tim (15) left TeamSpeak, but asked his friends to

keep him up to date, and if something happened, to write to him [via WhatsApp]. Then I just forwarded the breaking news to him, which I saw on TV. I practically forwarded all the breaking news from TV. "Explosion near Parliament," this is how I wrote to him. (Franz, 15)

Reflecting on this episode, the group of friends stressed the exceptionality both of the event and of the way they made use of WhatsApp:

That was a special case, I would say. WhatsApp is not in itself a place where we bombard ourselves with any political news, rather with incredibly irrelevant but somehow funny things. But this event was kind of special because it happened so suddenly and out of nowhere; nobody knew what was really happening . . . then you just use every network to somehow exchange information and keep up to date. (Franz, 15)

### ***Other Sources***

When talking about their information repertoires, the participants mentioned many more sources besides the intermediaries that were the focus of this study. Journalistic media (e.g., Tagesschau, Spiegel Online) are at the center of almost all repertoires; they become especially salient in times of breaking news or critical events. Older participants place a high level of trust in journalistic media and regard them (especially the editorial sections) as very important for news-related practices. Younger respondents are

often more critical and suspect certain tendencies in opinion, which they seek to counter through a broader set of sources.

A few opinion leaders among the respondents, who exhibited particularly topical interests and highly personalized repertoires of news sources, used Twitter and Reddit as information platforms. Other forms of user-generated content are used for special interests (blogs) or for in-depth study (Wikipedia), but they did not play an important role in opinion formation among the participants. Some participants mentioned news aggregators (e.g., Flipboard) that have been preinstalled on their smartphones. They help with undirected informational needs, and those that use these services reported that they trusted the curation of sources by the apps' administrators. Almost all respondents stressed the important role face-to-face communication plays in information sharing, especially within the groups, and placed personal contacts in the middle of their repertoire maps.

### **Knowledge and Reflected Use**

All users (as well as nonusers) had a basic knowledge of the general functionality of the various intermediaries, but detailed knowledge on them, such as search operators or options to change personalization settings, was unevenly distributed. For example, most users were able to distinguish between intermediaries as platforms and the content or channels they make available. But although it may be straightforward to distinguish platform and content with respect to Google and instant messaging services, participants were more prone to talk about social network sites as well as photo and video platforms as if they were "broadcasters" in and of themselves, without reflecting on the origins of individual videos or channels.

The attitude toward intermediaries was mostly cautious, marked partly by fundamental mistrust (see Dieter, cited in the introduction), and partly by a consideration of pros and cons:

I had a discussion with my parents the other day, whether it makes sense to trust them [Internet companies such as Facebook or Alphabet]. But I often get the feeling that big companies have to do things correctly and in a certain way, otherwise they would damage themselves. And who would want to do that? (Franz, 15, teenage friends)

Most users also demonstrated a general understanding of business models and advertising. The active users of intermediaries were, in general, aware of their intermediaries' corporate connections; they knew that Facebook owns WhatsApp and Instagram, and that Alphabet owns Google and YouTube. Almost all respondents noticed personalized advertising during their everyday use. Some saw the benefits; Jasmin (22, trainee council), for example, told us, "Well, if it is technologically possible, then I am very much in favor of seeing what I might like, even if I don't know that I like it yet." However, many expressed dissatisfaction, mainly because personalized ads were considered to be inaccurate or irrelevant. In addition, some participants reported that they were concerned about their "transparency," which they understood, in this context, as a certain sense of vulnerability to algorithmic targeting: "Well, I really feel transparent, because you notice: Aha! She searched for this or that, and now we bombard her nonstop with ads" (Sabine, 66, group of friends).

Besides advertising, respondents hold different assumptions about intermediaries' sources of revenue. Many of them imagine the sale of data and the sale of prominent positions along their news feed or search results as viable revenue sources. Some respondents also reflected on the trade-off between the benefits of personalization and necessary data flows:

Well, when the data is used for something that gives me no benefit, then I would start to think whether or not it is a good thing. But as long as I benefit from it, they can carry on collecting my data. (Franz, 15, teenage friends)

Regarding their knowledge of algorithmic selection and personalization, most users were, to a certain extent, aware of the existence and the (approximate) mechanisms of algorithmic personalization. Not all of them connected prioritization and personalization directly with their own user behavior, though. Sabine (66, group of friends), for example, confessed that it took her "a while to realize that there was a mechanism behind it. I've always wondered, how do they know I'm interested? But then I was a bit naïve." Other respondents offered a range of possible explanations for the prominent display of content: prominent positioning could have been purchased, the content could be popular with other users, or the content is ranked as "trustworthy" by Google. Almost all users recognized algorithmic recommendations of content on YouTube, but, similar to personalized advertisements, they often expressed dissatisfaction with the quality of the recommendations, which led to a general skepticism toward algorithmic selection. Partly because of these experiences, users of intermediaries usually disputed the existence of filter bubbles, whereas nonusers consider them to be a more realistic scenario.

Finally, users also reflected on the quality and moderation of content on the intermediaries they used. They were almost always dissatisfied with the large amount of content on YouTube and Facebook that they regarded as irrelevant or "trash." In terms of news content, respondents preferred editorial selection to algorithmic selection, the former being perceived as more transparent and reliable: "I know [journalism's] filter mechanisms but don't understand Facebook's or Twitter's algorithms" (David, 27, soccer fan club). All participants acknowledged that to find content that is helpful or trustworthy requires more human input and the curation of sources. Some described their (usually habitualized) rules for curation. Stephanie (22, trainee council), for example, explained when discussing Instagram that "a new account should give me something like 90% of the stuff I really like. If not, I unsubscribe immediately."

With respect to the quality of user comments, many respondents made a distinction between known contacts and other unknown users. Although both can help to identify a general distribution of opinions on socially relevant topics, comments by the former were considered to be more helpful and friendly. Comments from unknown users, in contrast, were often seen as uncivil, insulting, or bordering on hate speech, especially on the more popular pages and channels on Facebook or YouTube. Only Stephanie (22, trainee council) and Jonas (14, teenage friends) had already reported instances of problematic content. But both were disappointed by the lack of speed and decisiveness on the part of the intermediaries.

### Conclusion

Although the results presented in this article cannot claim to be representative in a statistical sense, they nevertheless provide detailed insights into the position digital intermediaries take within media repertoires and everyday informational practices. The general use of intermediaries among our respondents is widespread; all of them had used at least one of the main platforms, and almost all of them used Google and YouTube habitually. Regarding WhatsApp and Facebook, we found greater variance in use, mainly because both platforms (and Facebook in particular) posed issues of privacy for some of our respondents.

Overall, our qualitative study indicates that intermediaries have infiltrated news-related information management and communication in various ways. Nevertheless, despite widespread use, on the whole, intermediaries did not represent a central information hub for news and other information on socially relevant events and topics. Although the distinction between intermediaries and journalistic outlets might become harder to make, given that many of the latter rely on the former to transport their content, our interviewees considered off-line mass media, other online journalistic sources, and personal contacts to be more valuable. The exception were those few individual users with a deep interest in news who reported a strategic use of intermediaries to manage their diverse set of sources.

Yet reconstructing the information repertoires showed that all users addressed different informational needs with their intermediary use. This happens partly through directed searches for specific information (especially via search engines, and in some cases on YouTube), partly through unplanned confrontations with information and opinions (e.g., in a Facebook News Feed) or confrontations with information and opinions initiated by others from their extended network (e.g., via WhatsApp messages). Exchanges with known others on socially relevant topics most often took place via messaging services and occasionally on personal Facebook profiles. Yet respondents had virtually no interest in exchanging information with unknown others, especially given the current architecture of intermediaries that, in their opinion, do not foster constructive discussions. Users therefore considered the intermediaries as less important than traditional journalistic sources and face-to-face exchanges in forming opinions in the narrow sense of the term—that is, in shaping their own attitudes and viewpoints on certain topics and events.

All respondents possessed knowledge of and engaged in critical reflection of at least some of the intermediaries and their issues—for example, about data collection or a perceived low quality of content—but often arrived at different solutions to those issues. Three typical strategies emerged from the interviews: Consciously deciding not to use certain platforms (e.g., for privacy reasons), ignoring or shrugging off their concerns and continuing to use a platform, and acknowledging their concerns and continually reflecting on the trade-off between the perceived problems and the benefits a platform provides. This last strategy might include self-defined rules (e.g., refusing to rely on algorithmic recommendations) and the additional use of alternative services with equivalent content (e.g., a different search engine).

Complementing previous research, our findings emphasize the need for increased scrutiny of the mechanisms with which intermediaries shape and structure the ways we conceive of the world. In this respect, academic research can and should inform broader policy discourses on media regulation and the transparency of intermediaries (e.g., Gillespie, 2018; Klonick, 2017). At the same time, however, we have

to stress that they are only one element of broader repertoires and practices, shaping them at different stages and to varying degrees. This does not diminish their importance for contemporary public spheres, but should help in realizing that intermediaries are neither the sole culprit nor the sole fix for (factual or perceived) problems of public debate, such as the spread of disinformation, conspiracy theories, or hate speech. Hopefully, our study can motivate further research focusing on repertoires and relations, rather than single platforms.

Beyond these findings, the study also provided us with some methodological insight that might inform future studies. The decision to recruit preexisting groups, and to combine a group discussion with a follow-up of individual in-depth interviews has proven particularly fruitful. Because the participants knew each other beforehand, the group discussions could draw on many shared episodes and needed only a short introductory and "warm-up" phase before progressing. The individual interviews then gave us an opportunity to follow up on episodes and practices that were especially relevant or extraordinary in more detail. The mapping exercise was particularly helpful, not only in reconstructing and visualizing participants' media repertoires but also in providing a stimulus for (self-)reflection on their news-related behavior. For example, distinguishing between the importance of a platform or media outlet (marked by the proximity of the cards to the map center) and the frequency of its use (visualized by stickers in the original and circle size in the condensed version) allowed participants to articulate the structure and meaning of their repertoires and practices with nuance. Overall, the combination of methods and the data generated both by the participants (interview, repertoire maps, observation data, and screenshots) and the researchers (portraits, codings, and transcripts) allowed us to contextualize and cross-validate the participants' statements.

Invariably, there were limitations to our approach, and they extend beyond the problem of generalizing from a small sample such as ours. We need to acknowledge that we are dealing with self-reports, which are prone to errors of recall and social desirability. In terms of the former bias, research designs that make use of nonreactive digital trace data (e.g., De Vreese & Neijens, 2016; Mukerjee, Majó-Vázquez, & González-Bailón, 2018) can provide more reliable data and mitigate the problem that personalization effects and other outcomes of algorithmic selection are hidden from individuals, but emerge only from aggregate data. On the other hand, we have already mentioned that intermediaries are currently reducing access to such trace data for independent academic research. And even if they are available, they will lack the contextual information on meaning and shared understandings connected with certain platforms or episodes that more qualitative approaches are best suited to.

Regarding the later bias, respondents might have refrained from open and honest answers both toward their fellow group members (in the group discussion) and toward us researchers. On the other hand, meeting with the group first provided the opportunity to build an initial relationship and to address questions or potential anxieties. As a result, all our in-depth interviews were conducted in an already familiar atmosphere. Some participants even brought forward issues such as mental health problems or juvenile detention, which leads us to believe that the interviews produced open and honest answers.

Overall, we are aware that eventually only a combination of different qualitative and quantitative approaches will provide the necessary data to gain a rich understanding of online intermediaries, their use, and their social consequences. Regardless of the methods employed, one important lesson for future studies

is to take into account the relational nature of intermediary use, especially when patterns of information management and opinion formation are being scrutinized. This relational nature becomes visible, firstly, with respect to the social nature of interaction and exchange. Media users are not isolated individuals, but part of different, sometimes overlapping or conflicting communicative figurations. Research should aim to reconstruct these figurations, since they provide the grounds on which individuals share, discuss, and evaluate information on socially relevant topics. Secondly, intermediaries are always part of broader media repertoires. For this reason, we need study designs that take their relation to other information sources, media outlets, and arenas of exchange and discourse into account, preferably allowing for international comparisons. Such studies could also improve our knowledge on the differences in effects that stem from different national media systems.

### References

- Albarran, A. B. (Ed.). (2013). *The social media industries: Media management and economics*. New York, NY: Routledge.
- Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. *Journal of Economic Perspectives*, 31(2), 211–236. Retrieved from <https://web.stanford.edu/~gentzkow/research/fakenews.pdf>
- Archibong, I. (2018, April 4). *API and other platform product changes*. Retrieved from <https://developers.facebook.com/blog/post/2018/04/04/facebook-api-platform-product-changes/>
- Bakshy, E., Messing, S., & Adamic, L. A. (2015). Exposure to ideologically diverse news and opinion on Facebook. *Science*, 348(6239), 1130–1132. doi:10.1126/science.aaa1160
- Bessi, A., & Ferrara, E. (2016). Social bots distort the 2016 U.S. presidential election online discussion. *First Monday*, 21(11). doi:10.5210/fm.v21i11.7090
- Boczkowski, P. J., Matassi, M., & Mitchelstein, E. (2018). How young users deal with multiple platforms: The role of meaning-making in social media repertoires. *Journal of Computer-Mediated Communication*. Advance online publication. doi:10.1093/jcmc/zmy012
- Bode, L. (2016). Political news in the news feed: Learning politics from social media. *Mass Communication and Society*, 19(1), 24–48. doi:10.1080/15205436.2015.1045149
- Brundidge, J. (2010). Encountering “difference” in the contemporary public sphere: The contribution of the Internet to the heterogeneity of political discussion networks. *Journal of Communication*, 60(4), 680–700. doi:10.1111/j.1460-2466.2010.01509.x



- Bruns, A., & Burgess, J. (2014). Crisis communication in natural disasters: The Queensland floods and Christchurch earthquakes. In K. Weller, A. Bruns, J. Burgess, M. Mahrt, & C. Puschmann (Eds.), *Twitter and society* (pp. 373–384). New York, NY: Peter Lang.
- Bucher, T. (2017). The algorithmic imaginary: Exploring the ordinary affects of Facebook algorithms. *Information, Communication & Society*, 20(1), 30–44. doi:10.1080/1369118X.2016.1154086
- Covington, P., Adams, J., & Sargin, E. (2016). Deep neural networks for YouTube recommendations. In S. Sen, W. Geyer, J. Freyne, & P. Castells (Eds.), *Proceedings of the 10th ACM Conference on Recommender Systems (RecSys '16)* (pp. 191–198). New York, NY: ACM. doi:10.1145/2959100.2959190
- Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., . . . Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 113(3), 554–559. doi:10.1073/pnas.1517441113
- DeVito, M. A., Gergle, D., & Birnholtz, J. (2017). "Algorithms ruin everything": #RIPTwitter, folk theories, and resistance to algorithmic change in social media. In G. Mark, S. Fussell, C. Lampe, m. c. schraefel, J. P. Hourcade, C. Appert, & D. Wigdor (Eds.), *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 3163–3174). New York, NY: ACM Press. doi:10.1145/3025453.3025659
- De Vreese, C. H., & Neijens, P. (2016). Measuring media exposure in a changing communications environment. *Communication Methods and Measures*, 10(2/3), 69–80. doi:10.1080/19312458.2016.1150441
- Dubois, E., & Blank, G. (2018). The echo chamber is overstated: The moderating effect of political interest and diverse media. *Information, Communication & Society*, 21(5), 729–745. doi:10.1080/1369118X.2018.1428656
- Dutton, W. H., & Blank, G. (2013). *Cultures of the Internet: The Internet in Britain* (Oxford Internet Survey 2013 Report). Retrieved from <http://oxis.oii.ox.ac.uk/wp-content/uploads/2014/11/OxIS-2013.pdf>
- Edgerly, S., Thorson, K., Thorson, E., Vraga, E. K., & Bode, L. (2017). Do parents still model news consumption? Socializing news use among adolescents in a multi-device world. *New Media & Society*, 20(4), 1263–1281. doi:10.1177/1461444816688451
- Ernst, N., Engesser, S., Büchel, F., Blassnig, S., & Esser, F. (2017). Extreme parties and populism: An analysis of Facebook and Twitter across six countries. *Information, Communication & Society*, 20(9), 1347–1364. doi:10.1080/1369118X.2017.1329333

- Eslami, M., Karahalios, K., Sandvig, C., Vaccaro, K., Rickman, A., Hamilton, K., & Kirlik, A. (2016). First I "like" it, then I hide it: Folk theories of social feeds. In J. Kaye, A. Druin, C. Lampe, D. Morris, & J. P. Hourcade (Eds.), *Proceedings of the 2016 CHI Conference (Chi4good)* (pp. 2371–2382). New York, NY: ACM. doi:10.1145/2858036.2858494
- Ferrara, E. (2017). Disinformation and social bot operations in the run up to the 2017 French presidential election. *First Monday*, 22(8). doi:10.5210/fm.v22i8.8005
- Flaxman, S., Goel, S., & Rao, J. M. (2016). Filter bubbles, echo chambers, and online news consumption. *Public Opinion Quarterly*, 80(S1), 298–320. doi:10.1093/poq/nfw006
- Fletcher, R., & Nielsen, R. K. (2017). Are news audiences increasingly fragmented? A cross-national comparative analysis of cross-platform news audience fragmentation and duplication. *Journal of Communication*, 67(4), 476–498. doi:10.1111/jcom.12315
- Fletcher, R., & Nielsen, R. K. (2018). Are people incidentally exposed to news on social media? A comparative analysis. *New Media & Society*, 20(7), 2450–2468. doi:10.1177/1461444817724170
- Garrett, R. K. (2009). Echo chambers online? Politically motivated selective exposure among Internet news users. *Journal of Computer-Mediated Communication*, 14(2), 265–285. doi:10.1111/j.1083-6101.2009.01440.x
- Gerlitz, C., & Helmond, A. (2013). The like economy: Social buttons and the data-intensive web. *New Media & Society*, 15(8), 1348–1365. doi:10.1177/1461444812472322
- Gil de Zúñiga, H., Jung, N., & Valenzuela, S. (2012). Social media use for news and individuals' social capital, civic engagement and political participation. *Journal of Computer-Mediated Communication*, 17(3), 319–336. doi:10.1111/j.1083-6101.2012.01574.x
- Gillespie, T. (2018). *Custodians of the Internet: Platforms, content moderation, and the hidden decisions that shape social media*. New Haven, CT: Yale University Press.
- Halford, S., Weal, M., Tinati, R., Carr, L., & Pope, C. (2018). Understanding the production and circulation of social media data: Towards methodological principles and praxis. *New Media & Society*, 20(9), 3341–3358. doi:10.1177/1461444817748953
- Hasebrink, U., & Hepp, A. (2017). How to research cross-media practices? Investigating media repertoires and media ensembles. *Convergence*, 23(4), 362–377. doi:10.1177/1354856517700384
- Heatherly, K. A., Lu, Y., & Lee, J. K. (2017). Filtering out the other side? Cross-cutting and like-minded discussions on social networking sites. *New Media & Society*, 19(8), 1271–1289. doi:10.1177/1461444816634677

- Hermida, A. (2010). Twittering the news. *Journalism Practice*, 4(3), 297–308. doi:10.1080/17512781003640703
- Howard, P. N., & Kollany, B. (2016). *Bots, #Strongerin, and #Brexit: Computational propaganda during the UKEU Referendum*. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2798311](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2798311)
- Klonick, K. (2017). The new governors: The people, rules, and processes governing online speech. *Harvard Law Review*, 131, 1598–1670. Retrieved from [https://harvardlawreview.org/wp-content/uploads/2018/04/1598-1670\\_Online.pdf](https://harvardlawreview.org/wp-content/uploads/2018/04/1598-1670_Online.pdf)
- Kümpel, A. S., Karnowski, V., Keyling, T., & Kümpel, A. S. (2015). News sharing in social media: A review of current research on news sharing users, content, and networks. *Social Media + Society*, 1(2). doi:10.1177/2056305115610141
- Lee, C. S., & Ma, L. (2012). News sharing in social media: The effect of gratifications and prior experience. *Computers in Human Behavior*, 28(2), 331–339. doi:10.1016/j.chb.2011.10.002
- Lewis, P. (2018, February 2). "Fiction is outperforming reality": How YouTube's algorithm distorts truth. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2018/feb/02/how-youtubes-algorithm-distorts-truth>
- Merten, L. (2017, May). *Contextualised repertoire maps: A qualitative approach exploring the role of social networking sites in news-related media repertoires*. Paper presented at 67th Annual Conference of the International Communication Association, San Diego, CA.
- Mocanu, D., Rossi, L., Zhang, Q., Karsai, M., & Quattrociocchi, W. (2015). Collective attention in the age of (mis)information. *Computers in Human Behavior*, 51, 1198–1204. doi:10.1016/j.chb.2015.01.024
- Mosseri, A. (2018, April 8). *News feed FYI: Facebook recently announced a major update to news feed; here's what's changing*. Retrieved from <https://newsroom.fb.com/news/2018/04/inside-feed-meaningful-interactions>
- Mukerjee, S., Majó-Vázquez, S., & González-Bailón, S. (2018). Networks of audience overlap in the consumption of digital news. *Journal of Communication*, 68(1), 26–50. doi:10.1093/joc/jqx007
- Müller, P., Schneiders, P., & Schäfer, S. (2016). Appetizer or main dish? Explaining the use of Facebook news posts as a substitute for other news sources. *Computers in Human Behavior*, 65, 431–441. doi:10.1016/j.chb.2016.09.003
- Napoli, P. M. (2014). Automated media: An institutional theory perspective on algorithmic media production and consumption. *Communication Theory*, 24(3), 340–360. doi:10.1111/comt.12039

- Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A. L., & Nielsen, R. K. (2018). *Reuters Institute digital news report 2018*. Oxford, UK: Reuters Institute for the Study of Journalism, University of Oxford.
- Newman, N., Fletcher, R., Levy, D. A. L., & Nielsen, R. K. (2016). *Reuters Institute digital news report 2016*. Oxford, UK: Reuters Institute for the Study of Journalism, University of Oxford.
- Pariser, E. (2011). *The filter bubble: What the Internet is hiding from you*. New York, NY: Penguin Press.
- Puschmann, C., & Burgess, J. (2014). The politics of Twitter data. In K. Weller, A. Bruns, J. Burgess, M. Mahrt, & C. Puschmann (Eds.), *Twitter and society* (pp. 43–54). New York, NY: Peter Lang.
- Rader, E., & Gray, R. (2015). Understanding user beliefs about algorithmic curation in the Facebook news feed. In B. Begole, J. Kim, K. Inkpen, & W. Woo (Eds.), *Proceedings of the 33rd annual ACM Conference on Human Factors in Computing Systems (CHI 2015)* (pp. 173–182). New York, NY: ACM. doi:10.1145/2702123.2702174
- Schmidt, J.-H., Merten, L., Hasebrink, U., Petrich, I., & Rolfs, A. (2017). *Zur Relevanz von Online-Intermediären für die Meinungsbildung* [On the relevance of online-intermediaries for opinion formation]. Retrieved from <https://www.hans-bredow-institut.de/uploads/media/default/cms/media/67256764e92e34539343a8c77a0215bd96b35823.pdf>
- Shehata, A. (2016). News habits among adolescents: The influence of family communication on adolescents' news media use—Evidence from a three-wave panel study. *Mass Communication and Society, 19*(6), 758–781. doi:10.1080/15205436.2016.1199705
- Stier, S., Posch, L., Bleier, A., & Strohmaier, M. (2017). When populists become popular: Comparing Facebook use by the right-wing movement Pegida and German political parties. *Information, Communication & Society, 20*(9), 1365–1388. doi:10.1080/1369118X.2017.1328519
- Swart, J., Peters, C., & Broersma, M. (2018). Sharing and discussing news in private social media groups. *Digital Journalism, 2*, 1–19. doi:10.1080/21670811.2018.1465351
- Tandoc, E. C., Lim, Z. W., & Ling, R. (2018). Defining “fake news.” *Digital Journalism, 6*(2), 137–153. doi:10.1080/21670811.2017.1360143
- Turcotte, J., York, C., Irving, J., Scholl, R. M., & Pingree, R. J. (2015). News recommendations from social media opinion leaders: Effects on media trust and information seeking. *Journal of Computer-Mediated Communication, 20*, 520–535. doi:10.1111/jcc4.12127
- Vaccari, C., Valeriani, A., Barberá, P., Jost, J. T., Nagler, J., & Tucker, J. A. (2016). Of echo chambers and contrarian clubs: Exposure to political disagreement among German and Italian users of Twitter. *Social Media + Society, 2*(3). doi:10.1177/2056305116664221

- Vargo, C. J., Guo, L., & Amazeen, M. A. (2017). The agenda-setting power of fake news: A big data analysis of the online media landscape from 2014 to 2016. *New Media & Society*, 20(5), 2028–2049. doi:10.1177/1461444817712086
- Vieweg, S., Hughes, A., Starbird, K., & Palen, L. (2010). Microblogging during two natural hazards events: What Twitter may contribute to situational awareness. In E. Mynatt, G. Fitzpatrick, S. Hudson, K. Edwards, & T. Rodden (Eds.), *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)* (pp. 1079–1088). New York, NY: ACM. doi:10.1145/1753326.1753486
- Wilken, R. (2018). Social media app economies. In J. Burgess, A. E. Marwick, & T. Poell (Eds.), *The SAGE handbook of social media* (pp. 279–296). London, UK: SAGE Publications. doi:10.4135/9781473984066.n16