

Do News Actually “Find Me”? Using Digital Behavioral Data to Study the News-Finds-Me Phenomenon

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Abstract

Research on news exposure has shown that while political knowledge and interest largely determine the degree of active engagement with online news, some people are generally less willing to invest into actively staying informed. Instead, these people report to pursue a passive mode of relying on specific sources, such as social media, based on the belief that “news finds me” (NFM). Notably, the three dimensions of NFM—feeling informed, relying on peers, and not actively seeking news—combine intentions and perceptions related to news use. Understanding NFM perceptions, hence, requires an analytical distinction between active and passive modes of news use as well as reliable measures of (different types of) news exposure. We contribute to this field by combining a survey, tracked web-browsing data, and tracked Facebook data to investigate the relationship between NFM perceptions and exposure to online news, also taking into account political knowledge and interest as traditional predictors of active news use. Our results show that both political knowledge and interest are associated with more news exposure via web browsers and that political knowledge—but not political interest—is also associated with more news in people’s Facebook feeds. Compared with the NFM dimensions, political knowledge and interest are stronger predictors of online news exposure in our study. Taken together, the novel combination of Facebook and web tracking data provides evidence that online news exposure is shaped by a confluence of traditional factors and more diffuse interpersonal processes.

Keywords

news finds me, social media, web tracking, diffusion, media use, news, Facebook

People around the world are increasingly consuming news online (Newman et al., 2020). The quantity and diversity of online news sources create a “high-choice media environment” (van Aelst et al., 2017), in which users can come across news in a variety of ways. One key factor that drives differences in online news exposure is the level of activity people engage in to stay informed. While various studies have found political interest and knowledge to be strong predictors of active news use (e.g., Lecheler & de Vreese, 2017; Strömbäck & Shehata, 2019), recent research has demonstrated the prevalence of a more passive mode of news use, showing that some people are less willing to actively invest into staying informed about current news and political affairs (e.g., Kim et al., 2013; Lee & Xenos, 2020; Leonhard et al., 2020).

Several studies have shown that a substantial amount of media users pursue a more passive mode of mostly relying on friends and exposure on social media for receiving relevant news (Boczkowski et al., 2018; Song et al., 2020). This mode of “being informed without actively seeking the news”

(Gil de Zúñiga et al., 2020, p. 1606) has been called the “news-finds-me perception” (Gil de Zúñiga et al., 2017). The news-finds-me (NFM) perception describes “the extent to which individuals believe they can indirectly stay informed about public affairs [. . .] through general Internet use, information received from peers, and connections within online social networks” (Gil de Zúñiga et al., 2017, p. 107). In Germany, where the study we present in this article was conducted, 70% of online users report to find their news primarily online, 22% report to use Facebook for getting news (Newman et al., 2020), and 49% of online users hold high NFM perceptions (Gil de Zúñiga et al., 2020). In general, pronounced NFM perceptions have been found to be

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associated with higher levels of social media use and lower levels of political interest and knowledge (Gil de Zúñiga & Diehl, 2019; Leonhard et al., 2020).

Regarding the elements that define an NFM perception, a recent study has suggested to differentiate the concept into three dimensions, namely, feeling informed, relying on peers, and not actively seeking for news (Song et al., 2020). This differentiation highlights different stages of media use and also has implications for causal assumptions in that, for example, “not actively seeking” points to a priori predispositions for news use, whereas “feeling informed” rather describes a post hoc rationalization of previous or typical behavior. Subsequently, this raises questions about how these “passive” approaches to news use relate to more “active” media-use predictors traditionally discussed in research on news use.

Hence, building on these different predictors identified in prior research, the goal of our study is to assess how political interest and knowledge as traditional predictors of active news use compare to NFM perceptions as indicators of more passive news use when it comes to explaining actual online news exposure. Considering the limitations of self-reports on media use (Araujo et al., 2017; Prior, 2009; Scharrow, 2016), we look at actual news exposure as measured by tracking data to answer the three general research questions: (1) How do political interest and knowledge relate to observed news exposure in web-browsing histories and Facebook feeds? (2) How does NFM perception and its dimensions relate to observed news exposure in web-browsing histories and Facebook feeds? (3) How do political interest and knowledge (i.e., drivers of active news use) and NFM perception and its dimensions (i.e., perceived reliance on passive news use) interact?

To answer these questions, we use a unique dataset combining passively observed tracking and self-report data from a sample of German internet users. Specifically, we use a multi-method combination of an online survey and a passive recording of both web browsing and Facebook usage to investigate the relationship between NFM perception and its dimensions, political interest and knowledge, and actual online news exposure. With this study, we seek to add to the existing NFM literature by making use of data on actual news exposure as assessed by tracking data while also contrasting the role of established determinants of active news use (political interest and knowledge) with attitudes underlying a more passive mode of news use (NFM perception).

Active and Passive Online News Use

Previous research on both general and online news use has shown repeatedly that political interest and knowledge are two very important determinants (Lecheler & de Vreese, 2017; Strömbäck et al., 2012; Strömbäck & Shehata, 2019). When it comes to these dimensions of “political sophistication,” empirical evidence suggests that political interest can

be considered a rather stable predisposition (Kruikemeier & Shehata, 2017; Lecheler & de Vreese, 2017), which has been found to be particularly relevant for offline news use (Boulianne, 2011), whereas political knowledge, which is typically highly correlated with political interest, has been shown to not only influence subsequent news use but also benefit from it (Lecheler & de Vreese, 2017; Möller & de Vreese, 2019).

Social networking sites (SNS) have been considered a special case for online news exposure. That is, while SNS use has been shown to positively affect online political participation (Dimitrova et al., 2014), political knowledge does not seem to profit accordingly from their use (Dimitrova et al., 2014; van Erkel & van Aelst, 2021). SNS have, therefore, been criticized for having a potentially detrimental effect on the quantity and diversity of online news exposure. However, a recent study using web-browsing data found that the use of SNS and other intermediaries is associated with an increased exposure to online news, in terms of both quantity and source diversity (Scharrow et al., 2020). This supports earlier indications based on different methodological approaches (Fletcher & Nielsen, 2018; Möller et al., 2019). Results like these suggest that the use of SNS might be especially beneficial with regard to news use for people who tend to less actively seek out and follow news online as SNS use facilitates incidental exposure. However, researchers have also argued that there might be a “Matthew Effect,” meaning that the positive effect of social media use is more pronounced for individuals who already consume a comparably high amount of news and, accordingly, also show higher political interest and knowledge (e.g., Kümpel, 2020). For example, knowledge about the topic of a given story has also been shown to affect intentions of reading the full story (Karnowski et al., 2017).

Within social media, incidental news exposure is affected to a substantial degree by algorithmic selection, which is largely based on the reading, commenting, liking, and sharing of news by users (Boczkowski et al., 2018). At the same time, incidental news exposure might also be a delayed result of actively following media outlets in the past (Boczkowski et al., 2018). In other words, a brief period of active news use, such as clicking the “follow” (or “like”) button for a news outlet, likely affects subsequent passive news use as the content posted by the respective news outlets will be included in the user’s feed. Importantly, while more passive users less regularly click the “follow” button for news outlets than more active news consumers (Leonhard et al., 2020), more news could also be included in one’s social media feeds because of friends’ engagement with news outlets (Boczkowski et al., 2018). Driven by the perceived “share-worthiness” (Karnowski et al., 2021; Trilling et al., 2017) of news items, this diffusion of news via SNS “is a continuous process involving journalists, users, intermediaries, and algorithms” (Brosius et al., 2019, p. 133), which equally affects and is affected by a user’s surrounding social

network. News on SNS are, thus, brought to one's attention through the "interactive features and affordances of various social media platforms, particularly those which reduce attentional effort" (Oeldorf-Hirsch & Srinivasan, 2021, p. 11). It has repeatedly been shown that especially networks of likeminded contacts within SNS create fruitful grounds for further engagement with news items (commenting, liking, sharing) (cf. Barberá et al., 2015; Mitchelstein et al., 2020), which, in turn, benefits the diffusion of news within the network and may, thus, create or amplify the perception that "news finds me."

NFM Perception

In previous studies, the use of SNS has been shown to be positively correlated with a high NFM perception (Gil de Zúñiga et al., 2020). Notably, NFM perception neither depicts a motivation nor does it point to individual interest in public affairs. People with high NFM perceptions could easily be interested in news and public affairs, but do not see a need to actively search for news. As such, high NFM perceptions are widespread as findings from a multitude of countries indicate. In the studied countries, more than half of all online users hold high NFM perceptions, for example, in Italy (59%), Ukraine (71%), Taiwan (72%), or Spain (85%) (Gil de Zúñiga et al., 2020, p. 1612); slightly lower rates of online users displaying high NFM perceptions have been measured in the United Kingdom (39%), Japan (39%), New Zealand (42%), and Germany (49%). NFM perceptions are also more common among adults aged 35 years and younger (Gil de Zúñiga et al., 2020), women, and individuals reporting lower incomes (Gil de Zúñiga & Diehl, 2019). Moreover, so-called "news avoiders" have been shown to internalize NFM perceptions (Toff & Nielsen, 2018), and higher NFM perception has also been found to correlate with lower levels of political interest (Gil de Zúñiga & Diehl, 2019; Park & Kaye, 2020) as well as lower levels of political knowledge (Gil de Zúñiga & Diehl, 2019). Conversely, a recent survey among German online news users has shown passive SNS news use to be associated with an overestimation of one's own political knowledge (Leonhard et al., 2020), while people with higher NFM perceptions have also expressed the perception to be surrounded by politically knowledgeable and interested peers on SNS (Song et al., 2020).

NFM perception has been considered both a dependent and an independent construct in previous research on online news use. Typically measured through surveys by means of a multi-item construct (Gil de Zúñiga et al., 2017, p. 112), the items in the NFM scale ask respondents to judge (1) how well they feel informed, (2) how much they rely on peers for information, and (3) how regularly they actively seek for information. There are versions of the NFM scale with a total of three (e.g., Park & Kaye, 2020), four (e.g., Gil de Zúñiga & Diehl, 2019; Gil de Zúñiga et al., 2017, 2020), or six (e.g.,

Song et al., 2020) items, and the items are answered on either 7- or 10-point Likert-type scales. Typically, the items have then been aggregated into a mean score to look at a "monotonic relationship with other variables" (Song et al., 2020, p. 65). However, this one-dimensional aggregation may not fit the conceptional ambiguity of the construct. That is, the three dimensions address not only different aspects but also different stages of media use as they refer to attitudes that can be predictors or outcomes of news use (or both).

Song and colleagues (2020) have, hence, pointed out that separately considering the three dimensions of NFM perception—feeling informed, relying on peers, and not actively seeking—allows for more nuanced insights into respective dynamics. Specifically, the authors argue that not actively seeking information could be a consequence of the perception of feeling informed because people might rely on their peers for that. This additional nuance is also supported by their confirmatory factor analysis, which highlights the threefold dimensionality of the NFM construct.

Yet, also these relationships have to be interpreted against the backdrop that relying on surveys for capturing online news exposure can only explain parts of the story (Kümpel et al., 2015; Prior, 2009). That is, several studies have shown that self-report data on media use tend to be unreliable, especially if respondents are asked about types of media use that are socially (un)desirable or that they only very infrequently engage with (Araujo et al., 2017; Guess, 2015; Prior, 2009; Scharkow, 2016); two attributes that may also apply to online news use. Conversely, the digital trace data that are more commonly used in the growing field of computational social science often lack important information about the individuals, such as beliefs, attitudes, or perceptions. A way to address these limitations is to combine these two types of data (Stier et al., 2020), which is also what we did in this study.

Hypotheses

In contrast to active news use, which has been shown repeatedly to be driven primarily by political interest and knowledge, NFM perception presumes a passive online news-use behavior. To test the implications of this perception empirically, our study relies on a combination of passive measurements of news exposure on both websites and Facebook with self-report data from an online survey. To answer our first guiding research question, we look at the long-standing assumption of active news use being driven by political interest and knowledge. Specifically, we expect that people with higher levels of political interest and knowledge are exposed to more news content in both web-browsing histories and Facebook feeds.

H1a. The amount of news in web-browsing histories is positively associated with political interest and political knowledge.

H1b. The amount of news in Facebook feeds is positively associated with political interest and political knowledge.

Pertaining to the second guiding research question, previous research has shown that SNS use is associated with increased online news exposure and that SNS use also leads to news exposure from a higher number of different news sources (Scharkow et al., 2020). As NFM perception is associated with higher levels of social media use and a stronger reliance on social connections (Gil de Zúñiga & Diehl, 2019), it can be assumed that people with higher NFM perception also profit from more active SNS use as news are more likely to “find them” via these platforms. This should particularly be true for the NFM dimension “relying on peers” that directly addresses the importance of peers on social media. Conversely, we expect people with higher NFM perception who particularly report to “not actively seek” news (i.e., the second NFM dimension) to have smaller amounts of news sites in their web-browsing histories. In addition, we expect people who report to “feel informed” (i.e., the third NFM dimension) to be exposed to higher amounts of news in both their web-browsing histories and their Facebook feeds.

H2a. The amount of news in web-browsing histories is negatively associated with the NFM perception of “not actively seeking.”

H2b. The amount of news in Facebook feeds is positively associated with the NFM perception of “relying on peers.”

H2c. The amounts of news in both web-browsing histories and Facebook feeds are positively associated with the NFM perception of “feeling informed.”

Conceptualizing NFM perception as a passive mode of news use naturally raises the question of how these perceived or actual individual-level tendencies relate to well-established predictors of more active news use. Regarding the third guiding research question on the interplay of active and passive modes of online news use, then, we expect the relationship between the NFM dimension of “not actively seeking” and news exposure in web browsing to be moderated by political interest and knowledge. That is, while a perception of not actively seeking news is expected to relate to less news in web browsing (H2a), people with higher political interest and knowledge are also expected to receive more news via SNS (H1b). In line with findings indicating that social media use yields higher variation in online news (Scharkow et al., 2020), we expect people who are exposed to more news in their Facebook feeds to also click on some of these news which should, ultimately, also increase the amounts of news in web-browsing histories.

In addition to that, the concept of news diffusion suggests that one’s Facebook feed is partly determined by actively

following news outlets, which, in turn, can be expected to be driven by political interest and knowledge, but partly also by a passive observation of peers and their engagement with news. Hence, we assume the relationship between “relying on peers” and the amount of news on Facebook (H2b) to be moderated by political interest and knowledge. That is, a more active SNS use should only yield more news in one’s Facebook feed if a person shows a certain degree of political interest and knowledge and might, hence, have been actively subscribing to news outlets in the past or is surrounded by politically interested peers. Owing to homophily in social networks, individuals with high political sophistication can be expected to have a higher share of politically interested and knowledgeable individuals in their social networks (Gil de Zúñiga & Diehl, 2019). As a consequence, a perceived reliance on peers should only translate into more actual news exposure on SNS among politically sophisticated individuals.

H3a. Political interest and knowledge moderate the relationship between NFM perception of “not actively seeking” and news exposure in web-browsing histories.

H3b. Political interest and knowledge moderate the relationship between the NFM perception of “relying on peers” and news exposure in Facebook feeds.

Method

We employed a multi-method combination of an online survey and a passive recording (i.e., observation) of both web browsing and Facebook usage behavior. All of the data we used originate from a non-probability panel of roughly 2,000 German internet users who agreed to use a tracking software that hooks into the web browsers on their desktop computers and/or smartphones. The panel is managed by a German market research company which invited panelists to an online survey, in which they were asked to also install a plugin for their desktop browser to unobtrusively capture public Facebook posts (Haim & Nienierza, 2019).

A replication data set¹ and all analyses scripts for this study are available via the Open Science Framework (OSF): <https://osf.io/6xrej/>.

Web-Browsing Data

We used web-browsing data from March through May 2019 collected by the market research company in accordance with the ICC/ESOMAR International Code of Marketing and Social Research Practice. These data contain all logged visits from the respondents’ web browser on the domain level (e.g., facebook.com, nytimes.com) along with a timestamp and an anonymous user ID. Hence, no individual pages (e.g., news articles) are identifiable in this dataset. We then coded domains as news based on whether they are listed within the German Audit Bureau of Circulation’s (IVW)

traffic rankings for news² and/or included in previous research with similar data (Scharnow et al., 2020).

Overall, a total of $N=14,296,676$ domain visits was tracked across $N=1,121$ panelists (also see the “Survey Measures” section) over the 3 months. Of these visits, $n=995,989$ (7%) account for Facebook visits and $n=395,401$ (3%) account for visits to news websites. These shares are very much in line with comparable numbers from similar recent studies (e.g., Cardenal et al., 2019; Scharnow et al., 2020).

Survey Measures

For this study, we use data from an online survey conducted in March 2019. A total of 1,121 panelists for whom we also have web tracking data completed this questionnaire (also see Online Appendix, Section 1, Table A1). Forty-nine percent of these respondents were female and the age ranged from 16 to 67 years ($M=45.3$, $SD=12.75$). In the survey, we asked participants whether they have a personal Facebook account (80% indicated that they did) and those who reported to have one were invited to install a browser plug-in that captures the public posts in their Facebook news feed (see the “Facebook Data” section). In line with Gil de Zúñiga and colleagues (2017), we also asked about education, collapsing 13 education categories into four categories reflecting the German educational system: lower secondary education or less (26%), secondary education (30%), postsecondary education (24%), and tertiary education (20%). In addition to education, we also assessed income (a scale consisting of 13 income brackets; Md = “between €2,000 and <€2,500”) to control for these variables in our models.³ Comparing age, gender, and education with the most recent German census data from 2017 indicated a slightly younger and more highly educated sample, which can be considered typical for online surveys (also see Online Appendix, Section 1, Table A2).

Participants were also asked about their general political interest on a 4-point Likert-type scale from 1 (*not at all interested*) to 4 (*very interested*), averaging at $M=2.9$ ($SD=0.85$). Moreover, we posed three questions asking respondents to assign three pictures of leading politicians to their party and two questions about the German political system to estimate their political knowledge. The index of political knowledge was constructed by summing up correct answers, ranging from 0 to 5 ($M=2.9$, $SD=1.60$). For NFM perception, we used the same six items as Song and colleagues (2020) who added two items (“I am up-to-date and informed about public affairs news, even when I do not actively seek news myself,” “I do not have to actively seek news because when important public affairs break, they will get to me through social media”) to the original set of four statements by Gil de Zúñiga and colleagues (2017; “I rely on my friends to tell me what’s important when news happens,” “I can be well informed even when I do not actively follow the news,” “I do not worry about keeping up with the news because I know

news will find me,” and “I rely on information from my friends based on what they like or follow through social media”). We used the German translations provided by the authors of the original questionnaire and five-point Likert-type scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The full list of items, together with their descriptive statistics, can be found in the Online Appendix (Section 2, Table A5).

In concordance with Song and colleagues (2020), we employed confirmatory factor analyses to compare NFM perception as single four-item ($n=1,104$, $\chi^2=105.21$, $df=2$, $p<.001$, comparative fit index [CFI]=.90, Tucker–Lewis index [TLI]=.69, root mean square error of approximation [RMSEA]=.22 [.18, .25], standardized root mean square residual [SRMR]=.06) and six-item ($n=1,092$, $\chi^2=247.52$, $df=9$, $p<.001$, CFI=.87, TLI=.79, RMSEA=.16 [.14, .17], SRMR=.07) latent factors with the six-item construct divided into three latent factors ($n=1,092$, $\chi^2=75.64$, $df=6$, $p<.001$, CFI=.96, TLI=.91, RMSEA=.10 [.08, .12], SRMR=.03). We also looked at a mean-averaged version of the four-item construct (Cronbach’s $\alpha=.73$, $M=2.53$, $SD=.90$) which showed the same internal consistency as the original 10-point-scaled study (Gil de Zúñiga et al., 2017; $\alpha=.73$, $M=3.58$, $SD=1.76$). While none of the models shows an excellent fit, similar to Song and colleagues (2020), the three-factor solution fits our data best (for details, see Section 2 in the Online Appendix). Hence, we used the factor scores for the three NFM dimensions as separate predictors in our analyses.

Facebook Data

The $n=895$ respondents who reported having a personal Facebook account were asked whether they would be willing to install a browser plug-in that unobtrusively collects public posts from their Facebook news feed. The plug-in was available for Firefox and Chrome on desktop computers and respondents could install it through the respective official plug-in stores (Haim & Nienierza, 2019). Participants received an additional incentive of €5 for installing the browser plug-in (i.e., in addition to the compensation they received from the market research company for participating in the web tracking panel and the online survey). They were shown a brief informed consent describing the browser plug-in and the purpose of data collection in the online survey and could access an extended data-privacy information page hosted on an institutional website via a provided link. This procedure and the content of both the informed consent and privacy information page were based on work by Sloan and colleagues (2020) who combined survey and Twitter data in their study and are described in detail in a paper by Breuer et al. (2021). The plugin continuously collected public posts if they appeared on participants’ desktop screens while browsing their Facebook news feed. Accordingly, the posts were likely seen by the users, but not necessarily clicked on.

Hence, similar to the web-browsing data, these data can be seen to capture exposure rather than actual consumption. Participants were also able to log in to a project website for the browser plug-in to see and even delete any collected Facebook data. Notably, however, no participant made use of this option.

Of the $n=895$ Facebook users in our sample, 48% ($n=426$) agreed to install the browser plug-in, and 27% ($n=246$) actually installed and used the plug-in.⁴ Notably, this multi-step selection process entails risks of systematic biases. Indeed, our plug-in/Facebook subsample includes slightly higher shares of male participants than the original sample, is slightly more educated, and shows slightly higher political sophistication; however, all of these differences are very small (for details, see Section 1 in the Online Appendix, Table A1). Of these $n=246$ users, 60% ($n=147$) used the plug-in for a Chrome browser, while the remaining $n=99$ installed the Firefox plug-in. Installed plug-ins automatically prompted study participants to end the observation period by manually uninstalling the plug-in, starting two weeks after installation. Our time frame under investigation, thus, ranges from the beginning of the survey (March 5, 2019) until the date of the last data point in the plug-in data (May 30, 2019). In total, $n=37,820$ sessions (i.e., Facebook feeds) were recorded with a total of $n=739,710$ public posts. To identify news posts, the Facebook accounts behind all public posts included in our data were extracted and matched manually with the news domains in the web-browsing data (e.g., [facebook.com/derspiegel](https://www.facebook.com/derspiegel) and www.spiegel.de), yielding a total of $n=28,727$ (4%) identified public news posts.

Results

We tested our hypotheses through multiple regression analyses to probe the relationships between political knowledge and interest, the three NFM dimensions, sociodemographic information from the survey, and behavioral measures from both Facebook and web tracking. All dependent variables—news exposure in web histories (H1a, H2a, H2c, and H3a) and news exposure in Facebook posts (H1b, H2b, H2c, and H3b)—are heavily skewed; that is, in line with prior findings, few people saw a lot of news content, whereas the majority did not. As likelihood-ratio tests indicated the presence of overdispersion, we used negative binomial regression models instead of Poisson regressions to test our hypotheses.⁵ We included the overall number of public Facebook posts (H1b, H2b, H2c, and H3b) and general website visits (H1a, H2a, H2c, and H3a) in the respective models to control for the total amount of tracked internet and Facebook use which varied considerably.⁶

The first model for web-browsing histories (Table 1) tests H1a, H2a, and parts of H2c by regressing the amount of news visits in web-browsing histories on the three NFM dimensions, political knowledge and interest, and the control variables. Consistent with our first hypothesis (H1a), both

political knowledge and interest are positive and significant predictors of the amount of news website visits. Also, in line with our assumptions (H2a), the regression coefficient for the NFM dimension “not actively seeking” is negative and emerges as a significant predictor of the amount of news visits. In contrast, the NFM dimension of “feeling informed,” despite showing relationships in the expected direction, is not a significant predictor of news exposure in this model (H2c). While most of the control variables did not add significantly to the model, the total number of websites tracked (i.e., general internet use) is a strong predictor of the amount of news visits.⁷

The first model for news in Facebook feeds (Table 1) tests H1b, H2b, and one part of H2c by regressing the amount of public Facebook feed news posts on the three NFM dimensions, political interest and knowledge, and the control variables. Notably, here, only political knowledge is a positive and significant predictor of news exposure, whereas political interest is not significantly associated with the number of public news posts in the Facebook feed, thus providing only partial support for our assumption (H1b). Moreover, no NFM dimension is a significant predictor of news exposure via public Facebook posts, thus providing no support for this hypothesis (H2b). As such, also the NFM dimension of “feeling informed” did not show any significant relationship with the amounts of news posts in people’s Facebook feeds (H2c). Again, the control variable of total number of public posts tracked (i.e., general Facebook use) is the strongest predictor in this model. In addition, also tertiary education (positive) as well as household income (negative) show relationships with news exposure in participants’ Facebook feeds.⁸

In additional regression models for the two outcome variables, we found almost no indication for moderating effects of political knowledge and interest. That is, neither political knowledge nor interest generally moderate the relationship between the NFM perception of “relying on peers” and news exposure in Facebook feeds (H3b; Model 2 in Table 1). A small relationship only appears for political knowledge when omitting political interest from the model (Online Appendix, Section 3, Table A10, Model K-2). Similarly, neither political knowledge nor interest moderate the relationship between the NFM perception of “not actively seeking” and news exposure in web-browsing histories (H3a; Model 2 in Table 1). Again, a small association exists between political interest and news exposure when omitting political knowledge from the model (Online Appendix, Section 3, Table A9, Model I-2).

Discussion

This study combines survey data with digital trace data to compare the predictive power of NFM perceptions with political knowledge and interest for online news exposure via web browsing and Facebook. In contrast to studies relying solely on survey data, our results are more robust toward

Table 1. Regression Models on Online News Exposure.

	Web tracking news visits		FB public news posts	
	Model 1	Model 2	Model 1	Model 2
NFM: relying on peers	-0.37 (0.23)	-0.45 (0.23)	0.46 (0.49)	0.79 (0.73)
NFM: feeling informed	0.54 (0.31)	0.65 (0.31)*	-0.04 (0.71)	0.03 (0.70)
NFM: not actively seeking	-0.40 (0.14)**	-0.92 (0.26)***	0.06 (0.36)	0.11 (0.35)
Political knowledge	0.18 (0.04)***	0.19 (0.04)***	0.32 (0.10)**	0.39 (0.11)***
Political interest	0.19 (0.06)**	0.20 (0.06)**	0.10 (0.17)	0.07 (0.17)
Total captured Facebook posts (logged)			1.12 (0.06)***	1.10 (0.06)***
Total tracked web visits (logged)	0.94 (0.02)***	0.94 (0.02)***		
Gender (male)	0.06 (0.10)	0.04 (0.10)	-0.37 (0.25)	-0.35 (0.25)
Age	-0.01 (0.00)	-0.00 (0.00)	0.01 (0.01)	0.00 (0.01)
Secondary education	-0.00 (0.13)	-0.00 (0.13)	0.15 (0.33)	0.06 (0.33)
Postsecondary education	0.05 (0.14)	0.04 (0.14)	0.63 (0.36)	0.49 (0.36)
Tertiary education	0.25 (0.15)	0.29 (0.15)	1.23 (0.37)**	0.99 (0.38)*
Household income	0.03 (0.02)	0.03 (0.02)	-0.12 (0.04)**	-0.12 (0.04)**
Not actively seeking × political interest		0.12 (0.07)		
Not actively seeking × political knowledge		0.04 (0.04)		
Relying on peers × political interest				0.01 (0.19)
Relying on peers × political knowledge				-0.15 (0.08)
Intercept	-4.26 (0.33)***	-4.31 (0.33)***	-5.67 (0.76)***	-5.62 (0.78)***
AIC	11,739.22	11,736.48	1,564.65	1,563.95
Log-likelihood	-5,855.61	-5,852.24	-768.32	-765.98
<i>n</i>	1,086	1,086	241	241

Note. Dependent variables are the raw counts of tracked news website visits and captured news posts in users' Facebook feeds. Unstandardized coefficients (standard errors) from negative binomial regression models. "Primary education" is the reference category for education. * $p < .05$. ** $p < .01$. *** $p < .001$.

social desirability (as consuming news is typically deemed socially desirable) and a potential confounding⁹ between NFM and news-use measures. By differentiating NFM perception into previously suggested dimensions (Song et al., 2020) this study also takes into account the conceptual ambiguity of considering various stages of media use in that "not actively seeking," arguably, addresses a priori predispositions regarding news use, whereas "feeling informed" might actually describe a post hoc rationalization of behaviors.

Overall, our findings indicate that both political knowledge and interest are associated with more news exposure in web browsing and that political knowledge—but not political interest—is also associated with more news exposure via Facebook. Overall, this is very much in line with prior findings on the relevance of these dimensions for online news use (Karnowski et al., 2017; Lecheler & de Vreese, 2017; Strömbäck & Shehata, 2019). It also further emphasizes the importance of political knowledge and interest as predictors of exposure to news online.

In contrast, however, our findings indicate that neither web-browsing histories nor Facebook feeds differ much across varying levels of NFM perception. The only exception is that the perception of "not actively seeking" for news is associated with visiting fewer news websites in our sample. As in previous studies using a singular/unidimensional NFM perception (Gil de Zúñiga & Diehl, 2019), "not actively

seeking" also correlates negatively with political knowledge (Pearson's $r = -.20$, $p < .001$, $df = 1,090$). Considering "not actively seeking" an a priori predisposition toward news use and political knowledge both a predictor of news use and a result of news use, this finding suggests that this NFM dimension likely captures a more general attitude toward online news use rather than a perception that "news finds me."

Importantly, neither political knowledge nor interest generally interacts with individual NFM dimensions with respect to the amounts of online news exposure, both in web browsing and on Facebook. Instead, differences in the amounts of online news exposure were generally better explained by differences in political knowledge and interest as well as general internet or Facebook use.

Despite the absence of strong associations between NFM perceptions and online news exposure, our findings provide various suggestions for possible future directions in this stream of research. Specifically, the results of our confirmatory factor analysis for the NFM items and the varying internal relationships between the three dimensions (Online Appendix, Section 2, Figure A8) highlight important conceptual differences, especially between "not actively seeking" on one hand and both "feeling informed" and "relying on peers" on the other. The former might be interpreted as an a priori predisposition regarding news use, whereas the other

two dimensions presumably describe post hoc rationalizations of past or typical behavior. What follows from this is that NFM perception can be (and has been) conceptualized as either an independent or a dependent variable, calling for a differentiation between the different dimensions. The discrepancy between these dimensions also shows in the regression models. As such, a general belief to “indirectly stay informed about public affairs [. . .] through general internet use, information received from peers, and connections within online social networks” (Gil de Zúñiga et al., 2017, p. 107) does not translate into a mere increase in news exposure through either general internet or social media use. Instead, and in line with recent NFM research (Song et al., 2020), these findings highlight the need for a more differentiated view on the individual dimensions of NFM perception, which, ideally, also require multi-method investigations.

Among the three NFM dimensions, relying on peers shows the weakest relationships with both dependent variables in all of our regression models (Table 1). Not actively seeking only shows relevant (negative) relationships with the amount of news websites in web-browsing histories in the present study. While this relationship seems intuitive, the lack of a similar relationship with news on Facebook raises concerns about the applicability of this dimension to the broader concept of a passive NFM perception. In a similar vein, feeling informed also only shows (positive) relationships with the amount of news websites in web-browsing histories but not with the amount of news in Facebook feeds. This particularly highlights the importance of observational or, ideally, multi-method studies to investigate (online) news use.

While these indications need to be interpreted with caution given the limitations of the present study (more on this below), they echo a news environment driven by “shareworthiness” (Trilling et al., 2017) and a multifarious diffusion of information (Brosius et al., 2019). In such environments, news outlets facing fragmented audiences tend to address social media users separately (e.g., following different priorities of issues; Haim, 2019), yet with an engaging tone to have users spread their news throughout individual networks. A single news item, then, takes various routes in various contexts to reach users in various situations—in short, it diffuses throughout differently structured social networks. In contrast to a universally valid explanation, such an environment promotes a multitude of potential access routes to news for people (and vice versa). The absence of relevant relationships with the dimension “relying on peers” vis-à-vis small relationships of the other NFM dimensions with news only in web browsing rather than with news in Facebook feeds seem to support this notion. Instead, the long-standing indicators for active news use, political knowledge and interest, show clear associations with news exposure in both web browsing and Facebook feeds. Taken together, it seems more likely that online news use is shaped by a confluence of traditional factors and more diffuse interpersonal processes. A passive NFM perception might, therefore, help to further elaborate

on traditional reasons for active news use but not so much to explain actual news exposure. With regard to explaining actual online news exposure, the conceptual ambiguity between the NFM dimensions may be the reason for inconclusive or mixed findings.

Of course, this multi-method study also comes with limitations. As is typical for self-selected samples, opt-in biases need to be considered. Particularly, the subsample of 246 Facebook users is arguably even more biased due to self-selection than our starting sample of 1,121 web-tracking panelists (which, notably, already differs in several sociodemographic dimensions from national census statistics; see Online Appendix, Section 1). While respective biases need to be considered with great care (Jürgens et al., 2020; Sen et al., 2019), the consent rate of 22% for the use of the browser plug-in is in line with a previous study (Haim & Nienierza, 2019).¹⁰ Moreover, technical limitations make it impossible to track Facebook use within mobile apps. Consequently, our Facebook data are limited to desktop usage. When asked in the survey, respondents reported their share of Facebook use through desktop computers to be 46% on average. Importantly, this share is higher (i.e., 54%) among those participants who also installed the Facebook-tracking browser plug-in. Moreover, the data we have only capture news exposure, meaning that it is not clear whether or to what degree participants actually read and processed the respective news items. Finally, we broadly conceptualized and measured “news” content only at the domain level. Especially Facebook posts and websites of commercial broadcasters contain considerable shares of non-news content, such as entertainment TV shows. Future research will have to derive even more fine-grained measures of news exposure by also looking at the article content.

Despite these limitations, this study adds to existing knowledge about NFM perceptions and online news exposure, as it shows that other factors, such as education, political interest, and political knowledge, are better predictors of observed (instead of self-reported) exposure to online news. Notably, this is true both for news exposure via Facebook news feeds as well as through web browsing. Beyond that, the study also demonstrates the added empirical value of distinguishing the dimensions of NFM perception over combining them into one single factor.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. For data-privacy reasons, we cannot share the raw tracking data but only aggregated data files.
2. German Audit Bureau of Circulation (IVW; <https://www.ivw.eu/nachrichten/digital>) is one of two major providers in Germany of neutral and comparable audience metrics for advertisers. Aside from other categories, it maintains one of the country's largest datasets on news-traffic rankings, which includes the websites of all print outlets as well as a large share of other news outlets (Hasebrink, 2006).
3. Slightly deviating from the set of control variables included in the study by Gil de Zúñiga et al. (2017), we omitted "race," as it is not commonly included in German survey studies.
4. The discrepancy between those who agreed to install (48%) and those who actually installed (27%) the plugin, to a large extent, likely arises from technological restrictions, such as that the plug-in was available only for Firefox and Chrome and did not work with smartphones.
5. The main results are similar in ordinary least squares (OLS) regressions, yet with more uncertainty associated with coefficients and standard errors.
6. To address potential multicollinearity among independent variables (see Online Appendix, Section 1, Figure A3), we also present all models in versions with either only political knowledge or only political interest in Online Appendix (Section 3). With the exception of some minor changes in the size of some of the coefficients, however, the outcomes across these different models are stable.
7. This also holds when only including political knowledge or interest (Online Appendix, Section 3, Table A9).
8. Again, these findings hold when only including either political knowledge or interest (Online Appendix, Section 3, Table A10).
9. This potential confounding between NFM and news-use measures relates to the fact that the two measures are likely to influence each other, as people who report to rarely use news might, for example, rationalize that they rely more on their friends for staying informed.
10. As a further robustness check, we estimated both regression models for the news website visits (i.e., Models 1 and 2 in Table 1) also for the subsample of Facebook plug-in users (Online Appendix, Section 3, Table A11).

References

- Araujo, T., Wonneberger, A., Neijens, P., & de Vreese, C. (2017). How much time do you spend online? Understanding and improving the accuracy of self-reported measures of internet use. *Communication Methods and Measures*, 11(3), 173–190. <https://doi.org/10.1080/19312458.2017.1317337>
- Barberá, P., Jost, J. T., Nagler, J., Tucker, J. A., & Bonneau, R. (2015). Tweeting from left to right: Is online political communication more than an echo chamber? *Psychological Science*, 26(10), 1531–1542. <https://doi.org/10.1177/0956797615594620>
- Boczkowski, P. J., Mitchelstein, E., & Matassi, M. (2018). "News comes across when I'm in a moment of leisure": Understanding the practices of incidental news consumption on social media. *New Media & Society*, 20(10), 3523–3539. <https://doi.org/10.1177/1461444817750396>
- Boulianne, S. (2011). Stimulating or reinforcing political interest: Using panel data to examine reciprocal effects between news media and political interest. *Political Communication*, 28(2), 147–162. <https://doi.org/10.1080/10584609.2010.540305>
- Breuer, J., Al Baghal, T., Sloan, L., Bishop, L., Kondyli, D., & Linardis, A. (2021). Informed consent for linking survey and social media data—Differences between platforms and data types. *IASSIST Quarterly*, 45(1), 1–27. <https://doi.org/10.29173/iq988>
- Brosius, H., Haim, M., & Weimann, G. (2019). Diffusion as a future perspective of agenda setting. *The Agenda Setting Journal*, 3(2), 175–190. <https://doi.org/10.1075/asj.18022.hai>
- Cardenal, A. S., Aguilar-Paredes, C., Galais, C., & Pérez-Montoro, M. (2019). Digital technologies and selective exposure: How choice and filter bubbles shape news media exposure. *The International Journal of Press/Politics*, 24(4), 465–486. <https://doi.org/10.1177/1940161219862988>
- Dimitrova, D. V., Shehata, A., Strömbäck, J., & Nord, L. W. (2014). The effects of digital media on political knowledge and participation in election campaigns: Evidence from panel data. *Communication Research*, 41(1), 95–118.
- 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. <https://doi.org/10.1177/1461444817724170>
- Gil de Zúñiga, H., & Diehl, T. (2019). News finds me perception and democracy: Effects on political knowledge, political interest, and voting. *New Media & Society*, 21(6), 1253–1271. <https://doi.org/10.1177/1461444818817548>
- Gil de Zúñiga, H., Strauss, N., & Huber, B. (2020). The proliferation of the "news finds me" perception across societies. *International Journal of Communication*, 14, 1605–1633.
- Gil de Zúñiga, H., Weeks, B., & Ardévol-Abreu, A. (2017). Effects of the news-finds-me perception in communication: Social media use implications for news seeking and learning about politics. *Journal of Computer-Mediated Communication*, 22(3), 105–123. <https://doi.org/10.1111/jcc4.12185>
- Guess, A. M. (2015). Measure for measure: An experimental test of online political media exposure. *Political Analysis*, 23(1), 59–75. <https://doi.org/10.1093/pan/mpu010>
- Haim, M. (2019). *Die Orientierung von Online-Journalismus an seinen Publika: Anforderung, Antizipation, Anspruch* [The orientation of online journalism toward its audiences. Demand, anticipation, claim]. Springer VS. <https://doi.org/10.1007/978-3-658-25546-6>
- Haim, M., & Nienierza, A. (2019). Computational observation: Challenges and opportunities of automated observation within algorithmically curated media environments using a browser plug-in. *Computational Communication Research*, 1(1), 79–102. <https://doi.org/10.5117/ccr2019.1.004.haim>
- Hasebrink, U. (2006). IVW- Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e. V. In Hans-Bredow-Institut (Ed.), *Medien von A bis Z* (p. 169). VS Verlag für Sozialwissenschaften.
- Jürgens, P., Stark, B., & Magin, M. (2020). Two half-truths make a whole? On bias in self-reports and tracking data. *Social Science Computer Review*, 38(5), 600–615. <https://doi.org/10.1177/0894439319831643>

- Karnowski, V., Kümpel, A. S., Leonhard, L., & Leiner, D. J. (2017). From incidental news exposure to news engagement: How perceptions of the news post and news usage patterns influence engagement with news articles encountered on Facebook. *Computers in Human Behavior*, *76*, 42–50. <https://doi.org/doi.org/10.1016/j.chb.2017.06.041>
- Karnowski, V., Leiner, D. J., Kümpel, A. S., & Leonhard, L. (2021). Worth to share? How content characteristics and article competitiveness influence news sharing on social network sites. *Journalism & Mass Communication Quarterly*, *98*(1), 59–82. <https://doi.org/10.1177/1077699020940340>
- Kim, Y., Chen, H.-T., & Gil de Zúñiga, H. (2013). Stumbling upon news on the Internet: Effects of incidental news exposure and relative entertainment use on political engagement. *Computers in Human Behavior*, *29*(6), 2607–2614. <https://doi.org/10.1016/j.chb.2013.06.005>
- Kruikemeier, S., & Shehata, A. (2017). News media use and political engagement among adolescents: An analysis of virtuous circles using panel data. *Political Communication*, *34*(2), 221–242. <https://doi.org/10.1080/10584609.2016.1174760>
- Kümpel, A. S. (2020). The Matthew Effect in social media news use: Assessing inequalities in news exposure and news engagement on social network sites (SNS). *Journalism*, *21*(8), 1083–1098. <https://doi.org/10.1177/1464884920915374>
- Kümpel, A. S., Karnowski, V., & Keyling, T. (2015). News sharing in social media: A review of current research on news sharing users, content, and networks. *Social Media + Society*, *1*(2), 1–14. <https://doi.org/10.1177/2056305115610141>
- Lecheler, S., & de Vreese, C. H. (2017). News media, knowledge, and political interest: Evidence of a dual role from a field experiment. *Journal of Communication*, *67*(4), 545–564. <https://doi.org/10.1111/jcom.12314>
- Lee, S., & Xenos, M. (2020). Incidental news exposure via social media and political participation: Evidence of reciprocal effects. *New Media & Society*. Advance online publication. <https://doi.org/10.1177/1461444820962121>
- Leonhard, L., Karnowski, V., & Kümpel, A. S. (2020). Online and (the feeling of being) informed: Online news usage patterns and their relation to subjective and objective political knowledge. *Computers in Human Behavior*, *103*, 181–189. <https://doi.org/10.1016/j.chb.2019.08.008>
- Mitchelstein, E., Boczkowski, P. J., Tenenboim-Weinblatt, K., Hayashi, K., Villi, M., & Kligler-Vilenchik, N. (2020). Incidental news on a continuum: A comparative conceptualization of incidental news consumption. *Journalism*, *21*(8), 1136–1153. <https://doi.org/10.1177/1464884920915355>
- Möller, J., & de Vreese, C. H. (2019). Spiral of political learning: The reciprocal relationship of news media use and political knowledge among adolescents. *Communication Research*, *46*(8), 1078–1094. <https://doi.org/10.1177/0093650215605148>
- Möller, J., van de Velde, R. N., Merten, L., & Puschmann, C. (2019). Explaining online news engagement based on browsing behavior: Creatures of habit? *Social Science Computer Review*, *38*(5), 616–632. <https://doi.org/10.1177/0894439319828012>
- Newman, N., Fletcher, R., Schulz, A., Andi, S., & Nielsen, R. K. (2020). *Digital news report 2020*. https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2020-06/DNR_2020_FINAL.pdf
- Oeldorf-Hirsch, A., & Srinivasan, P. (2021). An unavoidable convenience: How post-millennials engage with the news that finds them on social and mobile media. *Journalism*. Advance online publication. <https://doi.org/10.1177/1464884921990251>
- Park, C. S., & Kaye, B. K. (2020). What's this? Incidental exposure to news on social media, news-finds-me perception, news efficacy, and news consumption. *Mass Communication and Society*, *23*(2), 157–180. <https://doi.org/10.1080/15205436.2019.1702216>
- Prior, M. (2009). The immensely inflated news audience: Assessing bias in self-reported news exposure. *Public Opinion Quarterly*, *73*(1), 130–143. <https://doi.org/10.1093/poq/nfp002>
- Scharkow, M. (2016). The accuracy of self-reported internet use—A validation study using client log data. *Communication Methods and Measures*, *10*(1), 13–27. <https://doi.org/10.1080/19312458.2015.1118446>
- Scharkow, M., Mangold, F., Stier, S., & Breuer, J. (2020). How social network sites and other online intermediaries increase exposure to news. *Proceedings of the National Academy of Sciences*, *117*(6), 2761–2763. <https://doi.org/10.1073/pnas.1918279117>
- Sen, I., Flöck, F., Weller, K., Weiß, B., & Wagner, C. (2019). A total error framework for digital traces of humans. *ArXiv:1907.08228 [Cs]*. <http://arxiv.org/abs/1907.08228>
- Sloan, L., Jessop, C., Al Baghal, T., & Williams, M. (2020). Linking survey and Twitter data: Informed consent, disclosure, security, and archiving. *Journal of Empirical Research on Human Research Ethics*, *15*(1–2), 63–76. <https://doi.org/10.1177/1556264619853447>
- Song, H., Gil de Zúñiga, H., & Boomgaarden, H. G. (2020). Social media news use and political cynicism: Differential pathways through “news finds me” perception. *Mass Communication and Society*, *23*(1), 47–70. <https://doi.org/10.1080/15205436.2019.1651867>
- Stier, S., Breuer, J., Siegers, P., & Thorson, K. (2020). Integrating survey data and digital trace data: Key issues in developing an emerging field. *Social Science Computer Review*, *38*(5), 503–516. <https://doi.org/10.1177/0894439319843669>
- Strömbäck, J., Karlsson, M., & Hopmann, D. N. (2012). Determinants of news content: Comparing journalists' perceptions of the normative and actual impact of different event properties when deciding what's news. *Journalism Studies*, *13*(5–6), 718–728. <https://doi.org/10.1080/1461670X.2012.664321>
- Strömbäck, J., & Shehata, A. (2019). The reciprocal effects between political interest and TV news revisited: Evidence from four panel surveys. *Journalism & Mass Communication Quarterly*, *96*(2), 473–496. <https://doi.org/10.1177/1077699018793998>
- Toff, B., & Nielsen, R. K. (2018). “I just google it”: Folk theories of distributed discovery. *Journal of Communication*, *68*(3), 636–657. <https://doi.org/10.1093/joc/jqy009>
- Trilling, D., Tolochko, P., & Burscher, B. (2017). From newsworthiness to shareworthiness: How to predict news sharing based on article characteristics. *Journalism & Mass Communication Quarterly*, *94*(1), 38–60. <https://doi.org/10.1177/1077699016654682>
- van Aelst, P., Strömbäck, J., Aalberg, T., Esser, F., de Vreese, C., Matthes, J., Hopmann, D., Salgado, S., Hubé, N., Stepińska,

A., Papathanassopoulos, S., Berganza, R., Legnante, G., Reinemann, C., Sheafer, T., & Stanyer, J. (2017). Political communication in a high-choice media environment: A challenge for democracy? *Annals of the International Communication Association*, 41(1), 3–27. <https://doi.org/10.1080/23808985.2017.1288551>

van Erkel, P. F. A., & Van Aelst, P. (2021). Why don't we learn from social media? Studying effects of and mechanisms behind social media news use on general surveillance political knowledge. *Political Communication*, 38(4), 407–425. <https://doi.org/10.1080/10584609.2020.1784328>

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