Appetizer or Main Dish?

Explaining the Use of Facebook News Posts as a Substitute for Other News Sources

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Appetizer or Main Dish?**Explaining the Use of Facebook News Posts as a Substitute for Other News Sources****Abstract**

An increasing number of, especially younger, users use Facebook as their primary source for news about political and societal issues. At the same time, research suggests that Facebook use contributes to societal knowledge gaps. Against this background, we investigate the antecedents of using Facebook as a substitute for other news sources. We argue that exposure to news posts on Facebook increases the feeling of being well-informed, regardless of actual knowledge acquisition. This might lead users, especially those with a low need for cognition (NfC), to use Facebook as a substitute for other news sources. We test these assumptions with an online survey ($n = 390$) of German Internet users. Results show that the feeling of being well-informed through Facebook is reinforced by the quantity of exposure to news content on Facebook but not by the amount of actually read news posts. The feeling of being informed is an important predictor of using Facebook news as a substitute. High NfC interferes with this effect. It makes the substitution of other news sources less likely—but only for moderate to high levels of the feeling of being informed. We discuss these results in the light of their societal consequences.

Keywords: Facebook, News Exposure, Need for Cognition, Feeling of Being Informed, Substitution

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1. Introduction

Facebook is altering the way people get in touch with news. News about current affairs have become an integral part of the content that is shared on the platform (Kümpel, Karnowski, & Keyling, 2015; Nielsen & Schrøder, 2014). Scrolling through the latest posts of one's Facebook news feed is often (more or less incidentally) related to stumbling upon news content. Research has begun to discuss positive and negative consequences of news exposure on Facebook. It has been found that accidental exposure to political content on Facebook supports political participation (Valeriani & Vaccari, 2015). However, research also shows that Facebook use interacts with education when it comes to knowledge acquisition. Facebook exposure increases issue and civic knowledge, but only for individuals with a high educational level (Yoo & Gil de Zúñiga, 2014). Less educated users do not seem to acquire political and societal issue knowledge from Facebook. That way, Facebook news posts could contribute to widening societal knowledge gaps between cognitively high and low engaged individuals.

The present study adds to this research. We argue that brief encounters with news content on Facebook could influence further news seeking and exposure. Two different effects on follow-up news exposure are conceivable: 1.) Users might use Facebook as a starting point to collect further information by either clicking on the link within the news post or seeking further information elsewhere. 2.) Or they might get the feeling of being sufficiently informed about what is going on in the world (Hollander, 1995; Park, 2001) and refrain from further news exposure. For the latter to occur, Facebook news exposure does not even have to contribute to actual knowledge. That

way, encountering news content on Facebook could reduce instead of enhance the individual level of information—especially, if Facebook posts were only used as heuristic indicators of feeling informed without being actually read and systematically processed.

With a survey of Facebook users, we investigate whether the feeling of being well-informed through Facebook is based upon the mere exposure to or actual reading and processing of news posts on Facebook. Moreover, we explore how the feeling of being informed is related to using Facebook as a substitute for other news sources. This helps to clarify the societal effects of Facebook's growing importance as a news outlet. In the context of increasing societal knowledge gaps, it is also important to explore whether an increased feeling of being well-informed through Facebook has the same effects for all individuals. We therefore consider inter-individual differences in substitutive Facebook use that trace back to differences in need for cognition (NfC; Cacioppo & Petty, 1982). People with a high NfC are more intrinsically curious and motivated to seek information (Cacioppo, Petty, & Morris, 1983; Olson, Camp, & Fuller, 1984; Verplanken, 1993). Substitutive Facebook use could thus be more likely for persons with low NfC. This might explain why Facebook news posts contribute to the formation of knowledge gaps (Yoo & Gil de Zúñiga, 2014).

2. Literature Review

2.1 News content on Facebook as a substitute for other news sources

If news use patterns are investigated, Facebook cannot be neglected anymore (Hermida, Fletcher, Korell, & Logan, 2012; Nielsen & Schrøder, 2014). According to a recent study of the Pew Research Center, 63% of Facebook members say that they use the social networking site (SNS) as a source for news (Pew Research Center, 2015). Moreover, 40% even describe it as the most important or at least an important way to receive news (Pew Research Center, 2015). 28% of Facebook members indicate that

they often or sometimes post news content (Pew Research Center, 2015). Facebook itself tries to promote this trend by giving more emphasis to news content within the news feed (Kacholia & Ji, 2013). At the same time, news providers extend their efforts to distribute news content via Facebook: All US newspapers with a weekday circulation of more than 100,000 run a Facebook page and spread links to their articles through the network (Ju, Jeong, & Chyi, 2013). However, it should be mentioned, that Facebook referrals generate only marginal traffic on the websites of news organizations (Ju et al., 2013). Those who follow links from Facebook spend less time on news websites than direct visitors (Pew Research Center, 2014). Exposure to Facebook news posts, thus, does not seem to significantly boost the use of other news sources.

The intensity with which Facebook is used as a news medium is strongly related to age. Concerning the sources for political news of the proceeding week, younger cohorts name Facebook as their most important source (Pew Research Center, 2015). This can be seen as a developing trend when compared to older data (Glynn, Huge, & Hoffman, 2012). Since general patterns of media use remain relatively stable over the life course (Peiser, 2000), cohort succession will probably lead to a continuously growing importance of Facebook as a news medium in the future. On the individual level, however, the use of Facebook news posts as a substitute for other news sources could have severe consequences. The Facebook news feed does not offer full-length articles but a very comprised form of information that consists only of a headline, two to three sentences about the main content of a news story, a picture, and social endorsement cues like comments or “likes” (Costera Meijer & Groot Kormelink, 2014). Such posts are no sufficient form of information. Relying upon them without following the integrated links and reading full-length articles could thus lead to a lower level of information.

2.2 The importance of the feeling of being informed

2.2.1 Consequences of the feeling of being informed through Facebook

In order to predict whether or not news posts on Facebook will lead users to consider Facebook as a sufficient substitute for other news sources, the most important factor is probably how well users believe they are informed after using Facebook. The feeling of being informed (or: subjective knowledge) is a meta-cognition, i.e. a cognition about a cognition (Metcalf & Shimamura, 1994). Feeling well-informed can be understood as the knowledge that people believe to have, independent of their actual knowledge (Hollander, 1995; Park, 2001). Studies from consumer research have shown that the feeling of being informed can have consequences for further information seeking behavior. It influences applied search strategies and used sources and increases confidence in the own judgment (Brucks, 1985; Dodd, Laverie, Wilcox, & Duhan, 2005). High self-reported knowledge can even lead to less additional information search (Wood & Lynch, 2002).

In consumer research and psychology, subjective knowledge is often conceptualized in a domain-specific way (see, e.g., Ran, Yamamoto, & Xu, 2016). However, communication researchers have also considered source-specific subjective knowledge, i.e. the feeling of being well-informed through a certain media message or outlet (see, e.g., Hollander, 1995; Mattheiß et al., 2013). For news content on Facebook, the source-specific feeling of being well-informed through Facebook could be an important predictor of exposure to news content from other sources. Individuals who feel that their Facebook news feed provides them with sufficient information about what is going on in the world should be less eager to look for further news content elsewhere. Thus, we hypothesize:

H1: The feeling of being well-informed through news posts on Facebook promotes the use of Facebook as a substitute for other news sources.

2.2.2 Antecedents of the feeling of being informed through Facebook

This assumption raises the question how the feeling of being informed through Facebook is actually developed. This seems especially relevant since it has been demonstrated that the feeling of being informed can lead to an “illusion of knowledge” (Hall, Ariss, & Todorov, 2007). Park (2001) has argued that exposure to news media content strengthens subjective knowledge without necessarily increasing actual knowledge. Results by Mondak (1995) support this assumption. He found that the mere access to news can create a feeling of being informed (also, see, Hollander, 1995).

The same could be true for news posts on Facebook. Especially younger people use Facebook several times a day (Duggan, Ellison, Lampe, Lenhart, & Madden, 2014) and that way frequently get in touch with news posts when scrolling through their news feed. Research suggests that scrolling through the Facebook news feed induces flow (Mauri, Cipresso, Balgera, Villamira, & Riva, 2011). Such a state of absorption in the current behavior (Nakamura & Csikszentmihalyi, 2014) could lead users to take note of the presented news content even if receiving news was not their original intention when opening Facebook (Valeriani & Vaccari, 2015). The mere presence of news posts within one’s news feed might have a reassuring effect on subjective knowledge. More specifically, news posts on Facebook could activate existing news knowledge schemes and, thereby, support individuals’ confidence that they possess sufficient knowledge about current affairs. This effect, however, does not require that the content of news posts, let alone the full-length articles that Facebook news posts usually refer to, are actually read. Facebook news posts could thus increase the feeling of being informed without contributing to actual knowledge.

To understand the underlying mechanisms of this assumption, it is necessary to consider how cognitive psychology conceptualizes the representation of knowledge in the human mind. It is assumed that knowledge is a very complex “[...] interconnected network, with numerous levels, stratifications, categories, and trees, containing varieties

of relationships, schemata frames, and associations” (Raaijmakers & Shiffrin, 1980, p. 208). Schemes represent concepts or units within this associative and adaptive network which are built around an object and contain characteristics or attributes associated with that object (Iran-Nejad, 1987). If external cues hint to an object or a specific aspect of it, the complete scheme or associative network that is linked with this object can be activated. Graber (1988, pp. 250–259) argued that scheme-based processing can have paradox consequences for exposure to media news content. If media messages are processed with low interest and involvement and thus inattentively, individuals tend to predominantly remember which of the existing knowledge units have been activated during exposure instead of memorizing the actual meaning of a processed message and thus gaining new knowledge (also, see, Lodge, Steenbergen, & Brau, 1995).

Exposure to news posts on Facebook could that way boost the feeling of being well-informed. Even in situations in which getting informed about current news topics was not the primary purpose of visiting Facebook, news posts within the news feed will probably be noticed. This should activate existing news knowledge schemes and also the meta-cognitive scheme of being well-informed. This meta-cognition could even be activated if users are extremely inattentive to the actual messages of news posts they encounter. It could be sufficient that they realize seeing posts on their news feed that stem from a well-known news outlet. The presence of one or more news organizations’ posts within the news feed could serve as a heuristic cue (see, e.g., Maheswaran, Mackie, & Chaiken, 1992) that activates the cognitive patterns “receiving news” or “being informed” and could thus contribute to a feeling of being well-informed.

Frequent exposure to the Facebook news feed should thus increase the feeling of being well-informed through Facebook, even if individuals do not visit Facebook with the intention to receive news and, as a consequence, also do not pay much attention to the news posts they are exposed to. This assumption is in line with media dependency

theory which argues that media effects on audience members are stronger if the respective media outlet has a greater importance within an individual's life (Ball-Rokeach, & Defleur, 1976). Thus, we pose the following hypothesis:

H2a: A higher frequency of exposure to the Facebook news feed increases the feeling of being well-informed through Facebook.

Moreover, it can be argued that not only the frequency of exposure but also the amount of news content individuals encounter when visiting Facebook should increase the subjective feeling of being informed. Users whose news feed contains more posts from news organizations get in touch with more news sources, headlines, images, and short descriptions of news stories. For these users, news knowledge schemes are activated with a higher frequency when scrolling through their Facebook news feed. The amount of news posts might thus be a decisive predictor for the feeling of being informed through Facebook—even if these posts are not actually read. For this mechanism to occur, the subjective impression that there is a large amount of news posts within the Facebook news feed is more important than their actual amount. Therefore, we hypothesize:

H2b: A higher perceived percentage of news posts within the Facebook news feed increases the feeling of being well-informed through Facebook.

However, subjective knowledge does not necessarily have to indicate an illusion of knowledge. On the contrary, research shows that it often correlates positively with objective knowledge (for a meta-analysis, see, Carlson, Vincent, Hardesty, & Bearden, 2009). Against this background, the way news posts are treated is very relevant. If users do not merely take them as heuristic cues for the activation of news knowledge schemes but instead actively turn their attention to the news posts and read instead of just scanning them, existing knowledge schemes could be transformed and actual knowledge could grow (Iran-Nejad, 1987). At the same time, the self-observation that

many news posts on Facebook are read and actual knowledge grows could also enhance the feeling of being informed. The same is true for following the links within news posts and reading (or watching) the complete linked news story. This leads us to the following hypotheses:

H2c: A higher perceived percentage of read news posts within the Facebook news feed increases the feeling of being well-informed through Facebook.

H2d: A higher perceived percentage of clicked links within news posts increases the feeling of being well-informed through Facebook.

That said, it is important to determine whether the feeling of being well-informed through Facebook is rather based upon the mere exposure to Facebook news posts or upon actually reading the posts and linked full-length articles or videos. If mere exposure to news posts had a higher impact on the feeling of being informed than actual news processing this would leave room for the assumption of an “illusion of knowledge” triggered by Facebook news posts (Hall, Ariss, & Todorov, 2007; Park, 2001). Therefore, we ask:

RQ1: Which of the hypothesized predictors of the feeling of being informed through Facebook is the strongest?

2.2.3 The feeling of being informed through Facebook as a mediator

It can furthermore be assumed that there are indirect effects of exposure to news posts. The feeling of being informed has been hypothesized to be influenced by the percentage of news posts within a person’s news feed as well as by the percentage of read and clicked news posts (H2a-d). Moreover, it has been assumed that the feeling of being informed affects the use of Facebook news as a substitute (H1). It should, therefore, mediate between exposure to news posts and the use of Facebook as a substitute for other news sources:

H3a: A higher frequency of exposure to the Facebook news feed indirectly increases the use of Facebook news as a substitute for other news sources through the feeling of being informed (mediation)

H3b: A higher perceived percentage of news posts within the Facebook news feed indirectly increases the use of Facebook news as a substitute for other news sources through the feeling of being informed (mediation)

H3c: A higher perceived percentage of read news posts indirectly increases the use of Facebook news as a substitute for other news sources through the feeling of being informed (mediation)

H3d: A higher perceived percentage of clicked news posts indirectly increases the use of Facebook news as a substitute for other news sources through the feeling of being informed (mediation)

2.3 The moderating role of need for cognition

But not only the subjective feeling of being informed could influence whether or not Facebook is used as a substitute for other news sources. There could also be influences which derive from the individual users' characteristics. Research has discovered that civic and issue knowledge varies as a function of Facebook use and its interaction with education (Yoo & Gil de Zúñiga, 2014). Individuals with a high education level seem to gain knowledge from using Facebook whereas less educated do not profit from Facebook exposure in terms of knowledge acquisition.

In our study, we focus on the perception of Facebook as a news source and its behavioral results. In this context, instead of focusing on formal education we concentrate on the more direct influence of the subjective importance of gaining knowledge. Need for cognition (NfC) represents individuals' general willingness to take cognitive efforts and deal with complex information (Cacioppo & Petty, 1982). NfC is a stable, discrete motivational construct (Cacioppo, Petty, Feinstein, & Jarvis, 1996).

Studies show that a high NfC coincides with a diversity of interests, intrinsic curiosity and a stronger motivation to systematically search and process information (Cacioppo et al., 1996; Cacioppo et al., 1983; Olson et al., 1984; Verplanken, 1993). Moreover, individuals with a stronger NfC have a higher preference for news consumption and are rather information- than entertainment-oriented (Cacioppo et al., 1996; Hallahan, 2009).

Against this background, it can be assumed that people high in NfC are less easily ready to confine their news use to the news content that they encounter on Facebook. Their drive for further information should be stronger and they should judge the information received through Facebook more critically (Cohen, Stotland, & Wolfe, 1955). Therefore, it can be hypothesized that:

H4: Need for cognition reduces the use of Facebook news as a substitute for other news sources.

Moreover, NfC could interact with the feeling of being informed which we conceptualized as the most important predictor of using Facebook as a substitute for other news sources. Tsfaty and Capella (2005) have demonstrated that a high NfC can reduce the impact of other factors on news exposure decisions. They found that media skepticism decreases exposure to television news—but only for individuals with a low NfC. Individuals with a high NfC watch more television news, regardless of whether they trust them or not. Accordingly, a high NfC should also reduce the impact of the feeling of being informed in our context. Individuals who have a higher NfC should be less willing to use Facebook news content as a substitute for other news sources—even if they feel well-informed through Facebook. Thus, we hypothesize:

H5: Need for cognition reduces the effect of the feeling of being informed through Facebook on the use of Facebook news as a substitute for other news sources (moderation).

Figure 1 gives an overview of the assumptions that have been made up to this point.

-- Figure 1 about here --

3. Method

3.1 Data

The data for this study were collected via an online-survey of adult Internet users in Germany, Austria, and Switzerland from June 23, 2015, to July 3, 2015. Participants were recruited from the large noncommercial online access panel *SoSciPanel*. Since participation rates in representative surveys via random digit dialing (RDD) are continuously dropping (Battaglia et al., 2008), researchers have begun to discuss alternative sampling modes. Research has shown that opt-in Internet panels as the one we have used result in a data quality that is comparable to traditional methods such as RDD (Ansolabehere & Schaffner, 2011; Yeager et al., 2011).

Panelists received an email invitation which stated that “we study how people catch up on current affairs and which role Facebook plays in this context. If you are a Facebook member, we would like to invite you to take part in our survey.” A similar wording was used at the front page of the questionnaire. The main purpose of this text passage was to convey the information that only individuals with a Facebook account could participate in the survey. Otherwise, no information about the study’s purpose was given beforehand. Additionally, we included a control question at the beginning of the questionnaire which asked whether participants were members of Facebook and used the services of the network at least once per month. Participants who answered “no” to this question were thanked and debriefed. Participants who answered “yes” continued to answer the survey.

This resulted in a total of $n = 390$ participants who completed the questionnaire (age: $M = 34.53$; $SD = 13.06$; 59.7% female; 85.7% with high school diploma). 57.9% of respondents indicated that they use Facebook several times per day. Another 20.3% indicated that they use Facebook about once per day. Since Facebook does not publish information on their user structure we cannot reliably judge how well the sample represents the population of Facebook users. Survey data indicate that the age distribution is in line with that of Facebook users in Germany (Tippelt & Kupferschmitt, 2015). Moreover, research suggests that social media users in European countries tend to be rather well-educated as compared to the general population (OECD, 2015, p. 147). Exploring the hypothesized relationships in a well-educated sample thus seems advisable. This decision is further supported by the fact that, in existing research, NfC only moderately correlates with formal education (Cacioppo et al., 1996, p. 217). Thus, even in a well-educated sample inter-individual differences in NfC should be clearly observable and effects of NfC can be tested.

3.2 Measures

Before participants were asked to self-report their news exposure on Facebook they were provided with a short explanation about news posts on Facebook on a separate page of the questionnaire. The page featured the screenshot of a single news post from a large television network's news division. The post dealt with the introduction of a new car toll and contained a link to an article on the website of the television network. However, in the questionnaire it was not possible to actually click and follow the link. Above the screenshot, there was a short explanation: "There are several ways to stay up-to-date about what is going on in the world. On Facebook, for example, you might encounter reports from news sites. They summarize the respective news topic in a few lines. Usually, they also contain a link to a longer piece of information on the website of the news organization. Below you can see an example for

such a news post.” This explanation should assure that the participants understood correctly what was meant with news posts on Facebook within the questionnaire.

3.2.1 Frequency of Facebook exposure

Participants were asked to self-assess with which frequency they open Facebook and look at their news feed. They chose between five answer options: 5 = several times per day (51.4%), 4 = at least once per day (18.0%), 3 = several times per week, but not daily (12.8%), 2 = about once per week (3.7%), or 1 = less than once per week (2.8%). For further analyses, the answers were treated as a quasi-metric scale ($M = 4.26$; $SD = 1.06$).

3.2.2 Impressions of news exposure on Facebook

The questions about perceived news exposure on Facebook followed immediately after the explanation of news posts. All constructs were measured using a slider bar that allowed all integer values between 0% and 100% as an answer. The perceived percentage of news posts among all entries of the participants’ news feed was measured using the following wording: “Your Facebook news feed does not only contain news posts like the one you have just seen but also posts from your friends or from celebrities or companies that you have liked. Please estimate for an average day: Approximately how many of the posts within your Facebook feed feature news about current affairs? 0% means that no post in your Facebook news feed is a news post, 100% means that all posts in your news feed are news posts” ($M = 34.15$; $SD = 26.35$). The perceived percentage of news posts which were actually read by the participants was measured as follows: “And how many of the news posts that you encounter while skipping through your Facebook news feed do you read at least briefly? Please again estimate a percentage using the slider bar” ($M = 59.07$; $SD = 32.04$). Moreover, we also measured the perceived percentage of news posts that the participants usually click upon. We asked: “Within news posts on Facebook you usually find links to a full-length

article. Sometimes news posts also feature videos that you can watch. You can click on these links or videos and read or watch them or you can ignore them. Please indicate how many of the videos or links within news posts on Facebook you usually click upon. Again, please do so using the slider bar” ($M = 34.57$; $SD = 26.03$).

3.2.3 Feeling of being informed through Facebook

In order to measure the feeling of being informed through Facebook we adapted a scale by Mattheiß et al. (2013) who experimentally investigated “subjective information” after exposure to a political TV talk show. We took four of the original items and changed the wording so that it related to Facebook instead of the talk show. Participants answered the items on a seven-point Likert-type scale ranging from 1 = I do not agree at all to 7 = I fully agree. The wording of the items can be found in Table 1. The four items showed a good internal consistency (Cronbach’s $\alpha = .89$).

3.2.4 Need for cognition

NfC was measured using a seven-item short version of the original NfC scale by Cacioppo and Petty (1982). Again, Table 1 gives an overview over the items. We used the same seven-point scale as for the feeling of being informed. However, the selected items were all negatively worded, so that low values indicate a high NfC. For the sake of clarity, the polarity of all items was reversed for further analyses in order to achieve that high scores indicate a high NfC. The seven items show a good internal consistency as well (Cronbach’s $\alpha = .81$). In order to prevent halo effects on the feeling of being informed need for cognition was assessed at the end of the questionnaire.

3.2.5 Use of Facebook as a substitute for other news sources

Whether news content on Facebook serves as substitute for the participants was measured using four items. Participants answered these items on the same seven-point Likert-type scale. Again, the four items yielded a good internal consistency (Cronbach’s $\alpha = .89$) and are summarized in Table 1.

--- Table 1 about here ---

3.3 Data analysis

Since our measures include several latent variables we opted to analyze the data using the structural equation modeling framework. Analyses were conducted with the software package MPlus 7.3 using maximum likelihood estimation and the full information maximum likelihood procedure to handle missing values. In a first step, we calculated a confirmatory factor analysis for the three latent constructs feeling of being informed, NfC, and substitutive Facebook use in order to test our measurement model (see Table 1). This model yielded a good fit as judged by absolute as well as incremental fit indices ($\chi^2(85) = 137.79, p \leq .001$; CFI = .983; RMSEA = .037; SRMR = .040). Therefore, it is possible to introduce manifest factors and structural paths into the model in order to test the hypotheses and the research question.

For this purpose, we proceeded in two steps. First, we calculated a structural model that tested all hypothesized relationships but the moderation hypothesis (H5). The resulting model is depicted in Figure 2. This model resulted in a good fit ($\chi^2(177) = 311.02, p \leq .001$; CFI = .952; RMSEA = .045; SRMR = .066).

A second version of the same model was calculated to control for common-method bias (Podsakoff, MacKenzie, & Podsakoff, 2012). The indicator variables of the two latent constructs feeling of being informed through Facebook and use of Facebook news as a substitute are operationalized rather similarly. It should, therefore, be tested whether a significant relationship between these two factors indicates an actual relationship between the two constructs or whether it is a product of common-method variance. This can be achieved by including a latent method factor into the model (Bagozzi & Phillips, 1982) which is composed of all indicator variables of both latent

constructs and is not allowed to correlate with any of the other constructs. The resulting model has a slightly improved fit ($\chi^2(169) = 282.29, p \leq .001$; CFI = .960; RMSEA = .042; SRMR = .065). All other model coefficients, including the regression coefficient for the relationship between feeling of being informed through Facebook and use of Facebook news as a substitute, are also marginally improved, however, without affecting the respective levels of significance. Thus, a common-method bias can be ruled out.

In order to test the interaction that was assumed in H5, we additionally calculated a latent moderation model following the LMS approach suggested by Klein and Moosbrugger (2000). This procedure allows to integrate an interaction term of two latent variables within a structural equation model. The resulting model is depicted in Figure 3. Within the LMS approach, models are calculated based on the raw data rather than on the variance-covariance structure of the variables (Klein & Moosbrugger, 2000). When this is the case, no chi-square and related test statistics are available to judge the model fit. But, since the models depicted in Figures 2 and 3 can be considered as nested models, the goodness of fit for the latent moderation model can be judged by comparing it to the model in Figure 2.

The comparison can be achieved by applying the likelihood-ratio test for nested models (Vuong, 1989). This test is built upon the fact that -2 times the loglikelihood difference (often denoted as D) is distributed as chi-square. It is, therefore, possible to calculate a p value from D and the degrees of freedom that result from comparing the numbers of parameters of the two models. The p value indicates whether the more complex model has a significantly better fit than the other. For our case, the result of the likelihood-ratio test ($D(1) = 20.13; p \leq .001$) suggests that this is true. The model fit has significantly improved by adding the latent moderation term into the model. Since the fit of the model depicted in Figure 2 was already acceptable, it can be assumed that the

LMS model has a good fit as well. This result of the likelihood-ratio test allows to interpret the estimated parameters of the latent moderation model for hypothesis testing.

--- Figure 2 about here ---

4. Results

In order to test H1 to 3 as well as RQ1 it is sufficient to look at the model that does not include the interaction effect proposed in H5. This model is depicted in Figure 2. In addition to the hypothesized relationships, the model also controls for possible effects of demographic variables by including age, education (0 = without high school diploma; 1 = with high school diploma), and gender (0 = male; 1 = female) as covariates for both dependent variables. However, results show, that the feeling of being informed through Facebook is independent of age ($B = 0.000$; $SE = 0.006$; n.s.), education ($B = 0.213$; $SE = 0.206$; n.s.), and gender ($B = -0.173$; $SE = 0.213$; n.s.). The use of Facebook as a substitute is also not affected by age ($B = -0.007$; $SE = 0.004$; n.s.), education ($B = -0.063$; $SE = 0.130$; n.s.), and gender ($B = 0.004$; $SE = 0.093$; n.s.).

Concerning our hypotheses, the results show that the feeling of being informed through Facebook makes it significantly more likely that Facebook is used as a substitute for other news sources. This confirms H1. H2a, H2b, and H2d are also supported: the frequency of Facebook exposure, the perceived percentage of news posts within the news feed as well as the perceived percentage of followed links within news posts lead to a stronger feeling of being informed through Facebook. Taken together, these variables explain a considerable amount of variance ($R^2 = .43$). However, H2c has to be discarded. The percentage of read news posts does not affect the feeling of being informed through Facebook. With RQ1, we asked which of the four variables has the strongest impact on the feeling of being informed through Facebook. This can be judged

by comparing the standardized regression coefficients which are not depicted in Figure 2 that features unstandardized coefficients. The standardized coefficients indicate that the influence of the perceived percentage of news posts within the news feed ($\beta = .401$) as well as the frequency of exposure ($\beta = .222$) are stronger predictors of the feeling of being informed than the perceived percentage of clicked news posts ($\beta = .145$). In other words: In order to get the feeling to be well-informed through Facebook, it is more important that many news posts appear in the news feed and that it is looked at frequently than that news posts are actually read or their integrated links followed.

In order to test the mediation hypotheses H3a-d, we relied upon a procedure suggested by Preacher and Hayes (2008). For this purpose, the model calculation also featured direct paths from the three independent variables to the final dependent variable Facebook as a substitute for other news sources. These paths have been omitted from Figure 2 for the sake of clarity. However, only the frequency of exposure significantly predicts substitutive Facebook use ($B = 0.108$; $SE = 0.032$; $p \leq .001$). The other three paths are insignificant which means that there are no direct effects of the perceived percentage of news posts within the news feed ($B = 0.003$; $SE = 0.002$; n.s.), the perceived percentage of read news posts ($B = -0.003$; $SE = 0.002$; n.s.) and the perceived percentage of clicked news posts ($B = 0.001$; $SE = 0.002$; n.s.) on the use of Facebook as a substitute.

The indirect effects were tested with 5,000 bias corrected bootstrap sub-samples on a 95% confidence interval. These tests yield mixed results. H3c has to be discarded since there is no significant direct effect of the amount of read news posts on the feeling of being informed. H3a, H3b and H3d, however, are supported. The indirect effects of frequency of exposure ($\beta = .135$; $p \leq .001$; LLCI = .083; ULCI = .188) and the perceived percentage of news posts within the news feed ($\beta = .245$; $p \leq .001$; LLCI = .165; ULCI = .324) are again considerably stronger than the indirect effect of the

perceived percentage of clicked news posts ($\beta = .088$; $p \leq .05$; LLCI = .023; ULCI = .154).

--- Figure 3 about here ---

With H4 it was hypothesized that a higher NfC decreases the use of Facebook news as a substitute for other news sources. Judged by the model depicted in Figure 2 this is true. However, when we look at the latent interaction model depicted in Figure 3 we see that the effect is conditional. The main effect of NfC is diminished when the interaction of NfC with the feeling of being informed is included in the model. It even barely fails to reach significance ($p = .053$). Therefore, in the strict sense, H4 has to be discarded. NfC affects the use of Facebook as a substitute for other news sources mainly in interaction with the feeling of being informed which is indicated by the significant regression coefficient of the interaction term in Figure 3. Together, the feeling of being informed and its interaction with NfC explain 61% of the variance of the use of Facebook news as a substitute.

In H5 it was hypothesized that a higher NfC decreases the effect of the feeling of being informed through Facebook on the use of Facebook news as a substitute. To judge whether this moderation effect occurs in the hypothesized way, we plotted the effect of the feeling of being informed on substitutive Facebook use for medium, low ($-1 SD$), and high ($+1 SD$) levels of NfC. The plot is depicted in Figure 4. It also features lines for the lower and upper bounds of the three graphs on a 95 % confidence interval. The scale of the feeling of being informed was normalized, i.e. the value 0 represents its mean. The plot shows that, for low levels of feeling of being informed, NfC does not moderate its relationship with the use of Facebook news as a substitute. Substitutive use is equally unlikely for individuals with different levels of NfC if the feeling of being

informed is low. However, the plot reveals that the higher the feeling of being informed through Facebook becomes the more decisive is NfC. When individuals feel well-informed through Facebook those with a low level of NfC are significantly more likely to use Facebook news as a substitute than those with medium and low levels of NfC. This is indicated by the fact that the confidence interval for high NfC does not overlap with those for medium and low NfC anymore. Therefore, there is partial support for H5. A higher NfC does decrease the effect of the feeling of being informed through Facebook on the use of Facebook news as a substitute—but only if the feeling of being informed is also high or, at least, moderate.

--- Figure 4 about here ---

5. Discussion

The results from this study add to the growing body of scholarship investigating the uses and impacts of online news behaviors and the role of social media in this context. Recent research points in the direction that news content on Facebook increasingly substitutes exposure to others news sources, especially among younger users. Our data show that the use of Facebook as a substitute is still at a moderate level, at least in our sample which consisted of many well-educated respondents. However, our results have also revealed that there are considerable inter-individual differences concerning the use of Facebook news as a substitute. The feeling of being well-informed is an important predictor of substitutive Facebook use. Individuals who have the impression that Facebook provides them with a sufficient amount of information about what is going on in the world more strongly tend to regard Facebook as a good substitute for other news sources.

Need for cognition interferes with this effect. Individuals with a high NfC have a significantly lower probability of using Facebook news as a substitute. However, this is a conditional effect. It is only true for users who feel well-informed through Facebook. Persons who believe that Facebook does not provide them with sufficient information hardly use it as a substitute for other news sources, independently of NfC. This can be interpreted as a floor effect. To sum it up, it can be concluded that predominantly Facebook users who feel well-informed through the SNS and have moderate or low levels of need for cognition tend to use Facebook as a substitute for other news sources.

These findings have considerable societal consequences. Authors have argued that the feeling of being informed might represent an illusion of knowledge, i.e. individuals could be convinced to have a high level of knowledge whereas in fact they have not (Hall et al., 2007; Hollander, 1995; Park, 2001). We have discussed a mechanism that explains how Facebook news content could induce such an illusion of knowledge. A large amount of news posts within an individuals' Facebook news feed could lead this person to believe to be well-informed about what is going on in the world, even if the person did not actually read and memorize the content of the posts. Since predominantly individuals with a low need for cognition use less other news sources if they feel well-informed through Facebook, such an illusion of knowledge could have negative effects on the distribution of knowledge within a society.

On a more positive note, however, the presence of news content within an individuals' Facebook news feed could also lead to unintended knowledge acquisition. Since Facebook is still mainly a social networking platform, many users will probably use it for social reasons. During their exposure to Facebook they could more or less accidentally acquire knowledge from the confrontation with news content that they stumble upon (Kim, Chen, & Gil de Zúñiga, 2013; Tewksbury, Weaver, & Maddex, 2001). That way, news posts on Facebook could also help diminish societal knowledge

gaps (Kobayashi & Inamasu, 2015). This effect, however, would require that news posts on Facebook or, even better, the full-length articles they serve as teasers for, are actually read.

Existing research suggests that this is true only for well-educated users. Facebook exposure only promotes civic and issue knowledge for this group. News content on Facebook thus appears to contribute to the formation and widening of societal knowledge gaps (Yoo & Gil de Zúñiga, 2014). Our findings add to this impression: Individuals with a low need for cognition use other news sources less often if they feel sufficiently informed through Facebook. Moreover, the feeling of being well-informed to Facebook does not increase as a function of how many news posts are actually read. Rather, the frequency of exposure to the Facebook news feed and the estimated amount of news content within the feed are the most important predictors of feeling well-informed through Facebook. Subjective knowledge could thus be boosted by a false heuristic inference. Individuals seem to interpret the mere presence of news posts within their news feed and their own exposure to this feed as an indicator for their own high news knowledge-regardless of whether they actually read and process the news they encounter. This leaves room for the assumption that news content on Facebook can induce an illusion of knowledge, at least for some users.

At the same time, however, we have observed that the perceived amount of clicked news posts is positively related to the feeling of being well-informed through Facebook. This rather points in the direction of actual knowledge acquisition as a predecessor of using Facebook as a substitute for other news sources. In order to determine more lucidly whether the feeling of being informed through Facebook is an illusion, future research will have to include an assessment of objective knowledge acquired from Facebook. Moreover, observational research should explore how users engage with their Facebook news feed and process the different pieces of information it

provides. In this context, it appears important to explore the effects of flow (Mauri et al., 2011) and addictive Facebook use (Hong, Huang, Lin, & Chiu, 2014; Kuss & Griffiths, 2011) on information acquisition from the Facebook news feed. Frequent checking of the news feed could strengthen the illusion of being well-informed and support substitution of other news sources. The present results emphasize the importance of these questions.

Inevitably, there are further limitations to the present study that call for future research. First, we rely on an opt-in Internet panel for our results. As noted in the method section, prior research has indicated that these volunteer samples provide data of similar quality to random sampling methods. In line with the demographics of social media users in Europe, our sample had a higher level of formal education than the general population. This is mirrored by the fact that the mean level of need for cognition is rather high in our data. That said, it has to be concluded that our results are especially informative for well-educated individuals. Future research should therefore aim to replicate the present findings with a special focus on formally less educated users. However, the fact that we observe very strong effects of the feeling of being informed and a conditional effect of NfC on substitutive use of Facebook news for a well-educated sample emphasizes the significance of these effects. In a sample with more respondents featuring a low NfC these effects might be observable even more clearly.

Next, we have argued that the feeling of being informed through Facebook is a self-perception and as such should largely depend on the individuals' perception of Facebook as a news source. That is why we decided to assess the perceived amount of news posts within the Facebook news feed as well as the percentage of clicked and read news posts via self-reports. However, this decision abbreviates the processes that are taking place. In order to judge the influence that, e.g., Facebook's decision to give more emphasis to news posts (Kacholia & Ji, 2013) has on the feeling of being informed and

the use of Facebook news as a substitute, it would be necessary to include an objective measure of exposure to news posts in the next step.

Experimental research could help to clarify with which intensity news posts on Facebook are processed. It can be assumed that a spiral process is taking place: The mere exposure to news on Facebook contributes to the feeling of being well-informed and Facebook will be judged as a sufficient source of information. As a consequence, users might use less other news sources, even if they do not sufficiently learn about news from Facebook. They might even actively contribute to an increase of news posts within their own news feed by “liking” more news organizations and within other persons’ news feeds by “liking” and “sharing” more news posts (Costera Meijer & Groot Kormelink, 2014). These behaviors could result in a further increase of the feeling of being well-informed through Facebook, not only in the own person but (because of the shared content) also in others. Future research should try to further investigate this spiral process of which only the initial phase has been empirically investigated in the present study.

Finally, it also remains unclear in the present study which news media outlets or channels are the ones that suffer from the feeling of being well-informed after Facebook usage. Our dependent variable was operationalized in a very general way leaving it open to participants which other news sources they use less because of Facebook. Future research could explore this in more detail. This question seems especially relevant from a media business perspective. We have discussed that many, if not all, major news organizations use Facebook with the intention to generate traffic for their individual websites. However, providing news content within the Facebook infrastructure could have the contrary effect. This is at least what our results indicate. Future studies should thus more thoroughly investigate whether substitutive effects occur for all types of news organizations and news topics.

6. Conclusion

Taken together, the results of the present research demonstrate that the exposure to news content on Facebook has multi-faceted consequences for news exposure through other channels. Our study shows that communication research benefits from moving past the isolated investigation of exposure to particular news platforms and focusing on the interrelations between different technologies. More specifically, our results show that features of a media technology, in our case the amount of news posts on Facebook, can contribute to a feeling of being informed that reduces exposure to other information technologies. As the news environment continues to evolve due to the development and diffusion of new information technologies, pervasive changes in information behavior are inevitable. These changes could have far-reaching societal consequences. Therefore, there is an urge for future research which captures the insights from the present study and develops them further.

From a practical point of view, it seems important for news organizations to be aware of the mechanisms described in the present study. They might not only have negative consequences for the distribution of knowledge within society but also for news producers. These organizations use social media platforms with the intention to increase awareness for their content and, more specifically, to re-direct users to their own websites in order to increase advertising revenues (Glynn et al., 2012). However, our results suggest that news posts on Facebook have the opposite effect, especially for users with a low need for cognition. The more news posts users with a low cognitive motivation encounter on Facebook the less they feel inclined to use other news media. This may be desirable for Facebook but not for organizations that actually produce news content. For them, Facebook news posts are a double-edged sword. They should try to make their users aware of the fact that news posts on Facebook can only be regarded as teasers but not as a sufficient information diet.

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Tables

Table 1: Measurement model of the three latent constructs

	λ	M	SD
Need for cognition			
I do not like to have the responsibility of handling a situation that requires a lot of thinking.	.63	2.41	1.71
Thinking is not my idea of fun.	.63	2.09	1.38
I would prefer a task that does not require much thought to one that is intellectual, difficult, and important.	.70	1.97	1.25
I do not find satisfaction in deliberating hard and for long hours.	.60	2.77	1.68
I only think as hard as I have to.	.61	1.93	1.44
I prefer to think about small, daily projects to long-term ones.	.56	2.99	1.63
I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	.75	1.84	1.27
Feeling of being informed through Facebook			
I feel well informed about current events through Facebook news posts.	.87	3.95	1.76
Based on the news posts on Facebook, I think that I am able to explain the important news of the day without difficulty.	.79	3.79	1.65
On the basis of news posts on Facebook, I think I could discuss current news topics with someone else.	.82	4.04	1.77
News posts on Facebook provide me with a good overview about the news of the day.	.82	4.56	2.00
Facebook as a substitute for other news sources			
Other news sources are less important to me because I receive all important information on Facebook.	.76	2.74	1.35
To stay up to date about current news, I mostly use Facebook.	.90	3.02	1.55
Facebook replaces other news sources for me.	.69	2.46	1.13
Since I can find news on Facebook I use other news sources less often.	.80	3.16	1.69

Note: Confirmatory factor analysis of the three latent constructs. $n = 390$. $\chi^2(85) = 137.79$, $p \leq .001$; CFI = .983; RMSEA = .037; SRMR = .040. Values are standardized factor loadings. All items are scaled from 1 (= I do not agree at all) to 7 (= I fully agree).

Figures

Figure 1. Summary of the hypothesized relationships.

Figure 2. Structural equation model testing the explanation of substitutive Facebook use. $n = 390$. $\chi^2(177) = 311.02$, $p \leq .001$; CFI = .952; RMSEA = .045; SRMR = .066. Values are unstandardized regression coefficients with standard errors in parentheses. All paths are controlled for age, education, and gender.

Figure 3. Latent moderation model testing the explanation of substitutive Facebook use. $n = 390$. Values are unstandardized regression coefficients with standard errors in parentheses. All paths are controlled for age, education, and gender.

Figure 4. Plot of the latent moderation.