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Article

Datafication Markers: Curation and User Network Effects on Mobilization and Polarization During Elections

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Abstract
Social media platforms are crucial sources of political information during election campaigns, with datafication processes underlying the algorithmic curation of newsfeeds. Recognizing the role of individuals in shaping datafication processes and leveraging the metaphor of news attraction, we study the impact of user curation and networks on mobilization and polarization. In a two-wave online panel survey (n = 943) conducted during the 2021 German federal elections, we investigate the influence of self-reported user decisions, such as following politicians, curating their newsfeed, and being part of politically interested networks, on changes in five democratic key variables: vote choice certainty, campaign participation, turnout, issue reinforcement, and affective polarization. Our findings indicate a mobilizing rather than polarizing effect of algorithmic election news exposure and highlight the relevance of users' political networks on algorithmic platforms.

Keywords
algorithmic platforms; datafication; election campaigns; mobilization; polarization

1. Introduction

The political landscape has evolved with the emergence of social media platforms as relevant sources for political communication and information, prompting a fundamental shift in election campaigns. Social media companies rely on datafication, which involves collecting, aggregating, and analyzing user data, to algorithmically curate newsfeed content (Poell et al., 2019; van Dijck, 2014). This process produces specific data footprints based on user behavior and network connections that determine their attractiveness to different types of algorithmically curated content, including news (Thorson, 2020). In the context of elections, algorithmic news exposure on social media platforms can influence voter mobilization, campaign engagement, and, ultimately, voting decisions

(e.g., Geers et al., 2017; Ohme, 2019; Suk et al., 2022). Moreover, social media platforms polarizing effects have garnered significant public attention in recent years, as they may affect people's attitudes toward political issues and the perception of other voters (Allcott et al., 2020; Cinelli et al., 2021).

While some studies have examined the relationship between a curated news diet and democratic key variables (Bode, 2016; Bos et al., 2022), little is known about how individual users' curation and networks relate to mobilization and polarization. By leveraging algorithmic attraction as a heuristic for understanding how users' behavior may impact algorithmic news exposure, we investigate whether users' (self-reported) curation and networks—which we treat as markers of subsequent datafication processes—are related to changes

in attitudes and behavior during the 2021 German *Bundestagswahl* (federal election).

Specifically, we examine the relationship between receiving election-related information on social media and: (a) vote choice certainty, campaign participation, and turnout (mobilization hypothesis; Oser & Boulianne, 2020); and (b) attitude reinforcement and affective polarization (reinforcing spiral hypothesis; Slater, 2007). We also examine whether this relationship is conditional on three datafication markers: users' following decisions, curation behavior, and network consistency. Our results indicate a stronger mobilizing than the polarizing effect of algorithmic election news exposure and data footprints.

2. Datafication and Algorithmic News Exposure

News exposure on social media platforms is influenced not only by individual user choices but also by news organizations, peers, and algorithms (Thorson & Wells, 2016). On the one hand, users' movements through social media environments generate digital behavioral traces that platforms such as Facebook, Instagram, and TikTok use for datafication (van Dijck, 2014). These platforms aggregate, combine, and correlate these traces, based on which they infer users' preferences for topics, stances, and other users (Thorson et al., 2021; van Dijck, 2014). These datafication processes create a symbolic "data footprint" of each user—a backend representation of the user's inferred preferences which determine their future exposure to content.

Data footprints are key to algorithmic curation, which aims to create a pleasant and engaging user experience, thus prolonging the time users spend on the platform. As Thorson et al. (2021) explain, individual engagement with content, such as reading, watching, or liking news on social media, increases the likelihood of future exposure to similar content. For instance, following local politicians may improve the odds of being informed about political developments in a citizen's precinct, while engaging with content on a specific political topic (e.g., climate change) leads to more of it being shown in the future (e.g., Twitter, 2023).

At the same time, an individual's data footprint is also marked by the networks this user is part of. For example, having a politically-active network of friends on these platforms increases the chance of seeing content that aligns with political standpoints of network ties, often congruent with users' attitudes (Ahmed & Gil-Lopez, 2022; Lee & Kim, 2017). Thus, previous engagement with and curation of political content as well as embeddedness in specific networks, not only determines whether people see political information on social media platforms but also the type of content they are exposed to. Thorson (2020) proposes algorithmic attractiveness as a heuristic for accounting for the interplay between users' choices, datafication processes across digital platforms, and news publishers' and other political actors' dissemination practices (p. 1068).

In this study, we view news exposure as a system (Thorson, 2020; Weeks & Lane, 2020) and analyze its agentic component by examining users' (self-reported) curation and networks, which we treat as—markers of subsequent datafication processes—that contribute to the algorithmic loop, determining a user's attractiveness to news and exposure to specific political content (e.g., Marquart et al., 2020a). In turn, algorithmic news exposure can impact mobilization and polarization. This is especially true during election cycles when political content is typically more prevalent in most citizens' news diets.

3. The Mobilizing Role of Algorithmic News Exposure in Election Campaigns

Informed citizens are critical for successful election campaigns (Downs, 1957). To make informed voting decisions, citizens need information on the issues discussed, candidates', and parties' political stances. Algorithmic platforms, tailoring news to individual users' interests, are believed to play a vital role in mobilizing key variables during campaigns. One function of news exposure is to increase vote choice certainty, the subjective confidence in deciding which candidate or party to vote for (Alvarez & Franklin, 1994). Election news exposure can help form a more certain voting intention, especially among younger voters (Colwell Quarles, 1979; O'Keefe & Liu, 1980). Although vote choice certainty cannot be "mobilized," it can be stimulated. Recent research has partly confirmed that exposure to algorithmic campaign news increases vote choice certainty, mediated by campaign participation activity (Ohme et al., 2018). Therefore, we aim to test whether algorithmic election news exposure during an election campaign predicts higher vote choice certainty over time.

While parties and candidates aim to influence voter decisions (Marquart et al., 2020b), voter engagement in election campaigns can take various forms, such as contacting politicians, discussing election topics in personal networks, volunteering for candidates, or attending campaign events (Holt et al., 2013; Ohme, 2019). Studies have found that social media use during election periods has a mobilizing effect on young citizens and the general population (Holt et al., 2013; Kushin & Yamamoto, 2010), and in comparison with non-algorithmic news (Andersen et al., 2020). Thus, we test for the relationship between the extent of algorithmic news exposure during the election campaign and voters' campaign participation over time.

High turnout is crucial for parties in election campaigns. Nevertheless, in recent years, turnout among younger citizens in European countries has declined (Moeller et al., 2018). The link between media use and turnout has been constantly investigated, with research suggesting a mobilizing effect (Oser & Boulianne, 2020). However, comprehensive analyses have produced mixed results, particularly for online communication (Marquart

et al., 2020b). In national elections, studies have consistently found a positive relationship between social media use (i.e., algorithmic election news exposure) and turnout (Bond et al., 2012; Moeller et al., 2018). Therefore, we investigate the relationship between the extent of algorithmic news exposure during an election campaign and the turnout decision over time (Figure 1):

RQ1: Is the exposure to election news on social media platforms during the campaign period positively related to a change in levels of (a) vote choice certainty,(b) campaign participation, and (c) turnout in the 2021 German *Bundestagswahl*?

4. The Polarizing Role of Algorithmic News Exposure in Election Campaigns

Besides possibly mobilizing citizens to participate in elections, algorithmic election news exposure may also have a polarizing effect on an attitudinal and affective level. Concerning the former, people prefer consuming information that aligns with their prior attitudes (e.g., Tyler et al., 2022). Thus, social media platforms create a basic prerequisite for attitude maintenance and can drive attitudes to become more extreme by algorithmic curation that feeds on and into inferred interests and prior attitudes (Cinelli et al., 2021; Ohme, 2021).

The Reinforcing Spirals Model (Slater, 2007) posits that selective exposure to congenial information reinforces issue-specific attitudes, leading to more extreme opinions over time and shaping subsequent information selection (Slater, 2015). Additionally, users' preference for ideologically homogeneous social networks reinforces these attitudes and drives social news curation (Cota et al., 2019; Feezell et al., 2021). During elections, when the opposing ideology becomes more salient in public discourse, citizens may retreat to their in-group to protect their social identity (Slater, 2015). Prior research indicates that repeated selective exposure (Song & Boomgaarden, 2017; Stroud, 2010) and exposure to algorithmic news on social media platforms (Ohme, 2021) are linked to more extreme political attitudes.

Polarizing effects can also occur on the affective level. Affective polarization is related to issue-specific positions but primarily concerns negative attitudes toward opponents (Finkel et al., 2020; Groenendyk, 2018; Iyengar et al., 2012). Scholars have attributed the rise in partisan hostility to the emergence of partisanship as a significant social identity that aligns societal divisions and conflicts, in a process called sorting (Iyengar et al., 2012; Mason, 2016; Törnberg, 2022). The idea of algorithmic sorting stems from studies on the US-American electorate, where partisanship has expanded beyond politics and into a broader "culture war" (Hetherington et al., 2018), leading to an increase in the number of topics linked to politics but a decrease in their diversity (Törnberg, 2022).

The effect of media use on affective polarization depends on the partisan nature of the content presented, but its direction remains inconclusive. Studies have shown that exposure to counter-attitudinal content, such as out-party news sources (Garrett et al., 2014) and opposing political views (Bail, 2021), actually intensifies affective polarization. This may be because our perception and interpretation of content heavily depend on our perception of the messenger, leading to people we dislike having little to no influence on us (Törnberg, 2022). Others show that exposure to pro-attitudinal news can increase hostility toward the political opponent (Garrett et al., 2014; Wojcieszak et al., 2020). Social media use, however, can also decrease polarization by exposing users to information from ideologically distant social ties (Barberá, 2015). For example, news exposure on Facebook during the US 2016 elections attenuated attitudes towards political opposition, indicating that a greater share of ideologically coherent news in one's news diet on algorithmic platforms can increase negative affect on partisans of opposing parties (Beam et al., 2018).

To investigate this process in the German context, we ask:

RQ2: Is the exposure to election news on social media platforms during the campaign period positively related to levels of (a) attitude reinforcement and (b) affective polarization during the 2021 German *Bundestagswahl* campaign?

5. The Moderating Role of Data Footprints

The heuristic of algorithmic attraction (Thorson, 2020) suggests that datafication markers of politically interested individuals are related to a higher frequency of news exposure on platforms. Building on that, we argue that datafication and algorithmic curation not only change whether people get election news on social media platforms but also what kind of news they get. Attitudinally and affectively coherent and appealing algorithmic news may be responsible for mobilization (the extent to which users engage with an election campaign and feel confident in their vote and turnout decision) while simultaneously reinforcing existing attitudes and affective polarization. However, there is limited research examining the effect of individual behavior on these platforms and user agency in the processes of mobilization and polarization. Some evidence suggests that conscious shaping of datafication markers can qualify the mobilizing potential of algorithmic news exposure during an election campaign (see Figure 1).

For instance, Marquart et al. (2020b) found that following politicians on social media platforms increased election news in young citizens' diets, leading to more civic messaging and participation. Likewise, a user's personal network on social media can have mobilizing effects. Strong ties on Facebook mobilize protest
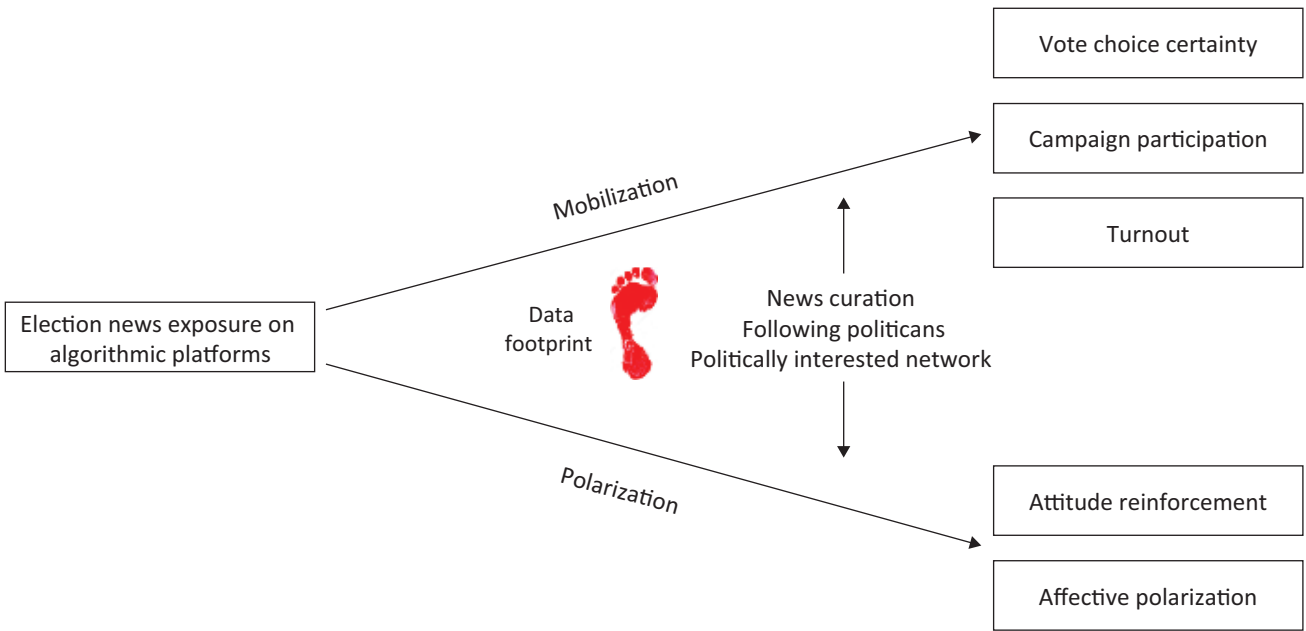
Figure 1. Analytical model of direct and indirect mobilization and polarization. Notes: The displayed model illustrates the relationship between data footprints, (a) algorithmic selection processes, and (b) the effects of news exposure, as analyzed in this study; for ease of illustration, we combine (a) and (b) in this model; chronologically (not displayed here), data footprints form before algorithmic news exposure and are dynamic and subject to change based on user behavior.

participation while observing friends' political behavior increases users' political activities (Bäck et al., 2021; Valenzuela et al., 2018). Studies indicate that information that aligns with citizens' political attitudes can mobilize political activity, increasing outspokenness among network members in homogeneous political networks (e.g., Wojcieszak et al., 2016; Zhu et al., 2017). However, reducing the number of opposing viewpoints through news curation and the following of specific politicians may lead to algorithmic curation that supports existing viewpoints, thereby reinforcing existing attitudes (see Allcott et al., 2020; Lee et al., 2018). Such homogeneous information mobilizes political participation (e.g., Lee et al., 2018; Mutz, 2002; Ohme, 2021). At the same time, a highly politically curated network can also contribute to greater political animosity (Bos et al., 2022; Merten, 2021; see Figure 1). As research investigating the outcomes of algorithmic news effects is sparse, we ask:

> RQ3: Is the direct relationship between exposure to election news on social media platforms and vote choice certainty, campaign participation, turnout, attitude reinforcement, and affective polarization during the 2021 German *Bundestagswahl* moderated by (a) the number of followed politicians, (b) news curation behavior, and (c) politically interested friends in users' network?

6. Method

To explore the proposed relationships, we rely on a two-wave panel online survey executed by a survey company (Dynata) a few weeks before and one week after the German federal elections on 26 September 2021.

6.1. Sample

Conducted from 26 August to 13 September 2021, the first survey was completed by 2621 respondents. After removing 403 "speeders" (completion time two/three below the soft launch median), 186 participants who failed both incorporated attention checks, 16 respondents with non-serious responses to open questions, and six who straight-lined two long batteries, the sample for the first wave consisted of 2009 respondents. Of these, 1,131 responded to the second survey conducted from 27 September to 1 October 2021. After applying the same quality checks, the sample was reduced to 1029 respondents. Respondents who indicated they had voted early by mail were excluded, which left us with a final sample of n = 943 participants. Respondents were sampled with a soft quota on age, gender, state, and education. As a result of systemic attrition and extensive quality criteria, the final sample is not representative and is around eight years older and more highly educated than the German population.

6.2. Measures

We provide the descriptives of all measures used in the analysis in Table 1. Where these combine multiple variables, single-variable descriptives are provided in the text.

6.2.1. Independent Variables

To assess exposure to political information on algorithmic platforms, we asked respondents to report on how many days in the past week they had been exposed to political information on five popular social media platforms, namely Facebook (M_{w2} = 1.33; SD_{w2} = 2.34), Twitter (M_{w2} = .40; SD_{w2} = 1.38), Instagram (M_{w2} = .58; SD_{w2} = 1.63), TikTok (M_{w2} = .17; SD_{w2} = .89), and YouTube (M_{w2} = .76; SD_{w2} = 1.86). We then formed a sum score to be used as our independent variable. Though we recognize the limitations of survey approaches to assessing news exposure, there is merit in letting people decide what they perceive and memorize as news exposure instead of inferring their news exposure based on tracking data in the same way that platforms do (Moe & Ytre-Arne, 2022).

6.2.2. Moderating Variables

The moderating variables were all measured at Wave 1 and treated as more stable than dynamic markers to fuel datafication processes, as user profiles that inform algorithmic selection processes built up over longer periods. We, therefore, asked about the general frequencies of the following perceived user behaviors.

News curation was measured using a sum score of two items asking participants how often, in general, they: (a) followed accounts or reacted to news content, political organizations, or individuals to see more of the respective content (M_{w1} = .59; SD_{w1} = 1; Min = 0; Max = 5); and (b) unfollowed/refrained from interacting with such content to see less of it (M_{w1} = .60; SD_{w1} = 1.07). We combined these two types of actions, as we were interested in the agency users exert on algorithmic curation processes in general.

Following politicians was measured by asking participants to estimate how many accounts of German politicians they followed in ordinal steps ranging from (0) *no accounts* to (6) *more than 100 accounts*.

To assess respondents' politically interested network, we asked them to indicate the proportion of their network they perceive to be politically interested, ranging from 0–100 (M_{w2} = 31.37; SD_{w2} = 29.02). We acknowledge that this is a tendency measure and, as such, not intended to reflect actual political interest among network contacts. Thus, it may be biased towards the active network that respondents perceive. However, since active network contacts are likely to have a greater impact on algorithmic curation and have a higher likelihood of being perceived by users, they can serve as a proxy for how likely it is that network contacts engage with political content.

6.2.3. Dependent Variables

To measure turnout, in Wave 2, participants were asked to indicate whether or not they had cast a vote in the elections. Multiple response choices for non-voters (with different reasons for not voting) and a question framing focusing on non-voters were used to minimize social desirability effects. Still, 90.7% indicated they had voted in the German elections, almost 15% more than the overall turnout. To estimate the change in turnout, we rely on a 4-point scale measuring the intention to vote in the upcoming elections in Wave 1. Those who indicated an intention to vote with definitely and probably were grouped (92.3%) to represent the (probable) voters.

Table 1. Descriptive statistics.

Statistic	n	Mean$_{W1}$	SD_{W1}	M_{W2}	SD_{W2}	Min	Max
Algorithmic news exposure	943	—	—	4.06	6.54	0	42
News curation	943	1.19	1.81	—	—	0	10
Politicians in network	943	.50	1.23	—	—	0	6
Politicians interested network	943	31.37	29.02	—	—	0	100
Turnout	943	—	—	.91	.29	0	1
Voting intention	943	.92	.27	—	—	0	1
Campaign participation	938	5.56	7.27	5.39	7.64	0	54
Vote choice certainty	813	6.13	1.28	5.98	1.42	1	7
Attitude reinforcement	943	—	—	.23*	.42	0	1
Affective polarization	931	2.89	0.98	3	.9	0	4.95
Age	943	53.57	13.31	—	—	18	75
Gender	943	1.51	.50	—	—	1	3
Traditional news exposure	943	—	—	4.05	1.81	0	6
Political interest	943	3.79	.81	—	—	1	5
Education	943	4.81	1.72	—	—	1	8

Note: * A change from Wave 1 to Wave 2 was calculated in a single measurement.

Campaign participation was measured using nine items on a 7-point ordinal scale (*not at all–daily*), asking how often participants had participated in campaign-related activities in the last month, such as volunteering for a political candidate or a political party. The items were combined to a sum score (Table 1).

Vote choice certainty was measured with one item assessing the certainty regarding one's perspective and casted vote on a 7-point Likert scale ranging from *very uncertain* to *very certain* (Table 1).

To assess attitude reinforcement, we asked participants in both waves to what extent they support or oppose measures to combat climate change on an 11-point Likert scale (M_{w1} = 8.50; SD_{w1} = 2.75; M_{w2} = 8.41; SD_{w2} = 2.80). We chose the issue of climate change as it was very salient in societal debates and the party manifestos before the elections, relative to other topics. An attitude was considered reinforced when it moved closer towards the endpoint of the scales in Wave 2, but not if it crossed the scale's midpoint, moved away from the closer pole of the scale, or stayed the same (see Ohme, 2021, for a similar approach). Based on the change between Waves 1 and 2, a combined measure was created (Table 1).

Affective polarization scores were measured following Wagner (2021). This approach looks at the spread of respondents' party-like-dislike scores, allowing us to measure affective polarization in multi-party contexts. A proposed weighting of parties by their vote share had to be disregarded due to data restrictions. However, in the context of the 2021 election with relatively similar-

sized parties, the impact of this decision should be relatively small (M_{w1} = 2.89; SD_{w1} = .98; M_{w2} = 3; SD_{w2} = .90).

6.2.4. Controls

We additionally measured age, gender, political interest (1 = *not at all politically interested*, 5 = *very politically interested*), news exposure in traditional news media (0 = *not at all*, 6 = *daily*), and education (based on an ascending, German education scale) to be used as controls in all of our models.

6.3. Analytical strategy

We use cross-sectional analysis to model direct relationships and lagged dependent variable models to explore the main and interaction effects on change in outcome variables. To isolate the change between the two waves, we held constant the respective Wave 1 variables for all Wave 2 dependent variables, except for the attitude reinforcement variable, which is already constructed as a change between the two waves (see details below). For each outcome variable, we estimated one model to test the main effects of algorithmic election news exposure, news curation, the number of political friends, and the number of politician accounts followed, and three models for the respective interaction effects. In the results section, we present an overview of the modeled relationships (Table 2), while the full regression model tables can be found in the Supplementary File.

Table 2. Effect directions and significance across all models.

Excluding lagged dependent variable

	Campaign participation	Turnout	Vote choice certainty	Attitude reinforcement	Affective polarization
Direct effect algorithmic exposure	+*	0**	0	0	0
Direct effect curation	+	0	+	0	0
Exposure × curation	+	0	0	0	0
Direct effect political network	0	0	0	0	0
Exposure × political network	+	+	0	0	0
Direct effect following politicians	0	0	0	0	0
Exposure × following politicians	+	0	0	0	0

Including lagged dependent variable

	Campaign participation	Turnout	Vote choice certainty	Attitude reinforcement	Affective polarization
Direct effect algorithmic exposure	+	0	0	0	0
Direct effect curation	+	0	+	0	0
Exposure × curation	+	0	0	0	0
Direct effect political network	0	0	0	0	0
Exposure × political network	0	0	0	0	0
Direct effect following politicians	0	0	0	0	0
Exposure × following politicians	+	0	0	0	0

Notes: * + = significant, positive effect; ** 0 = insignificant (*p* > .05). The top table represents the results of the multiple regression models using Wave 2 variables as dependent variables; the bottom table shows the results of our lagged dependent variable models.

7. Results

7.1. Mobilizing Effects

We find support for the direct relationship between algorithmic exposure and campaign participation ($b = .36$; $p < .001$, Table A1 from the Supplementary File). Campaign participation is also higher among citizens who engage in news curation behavior more frequently ($b = 1.12$; $p < .001$). Looking at the moderation with behavioral traces, there is evidence that people who use algorithmic election news more frequently and (a) curate their news diet more strongly ($b = .06$; $p < .001$), (b) have more politically interested friends in their network ($b = .00$; $p < .001$), (c) follow a greater number of politicians ($b = .10$; $p < .001$), and have a higher chance of participating in campaign activities. These models control for political interest, whereas higher levels were associated with higher campaign participation. When adding the lagged dependent variable of campaign participation on $t1$ to the models and thereby estimating the change during the campaign period (see Table A2 from the Supplementary File), we still find that algorithmic election news exposure ($b = .22$; $p < .001$) and news curation ($b = .42$; $p < .001$) can explain an increase of campaign participation over time. Moreover, we see that news curation positively moderates the effect of algorithmic media use ($b = .03$; $p = .018$). Hence, individuals who curate their news diet more strongly become more easily mobilized by algorithmic election news exposure to participate in the campaign. We find a similar result for the number of politicians followed: Individuals who follow a greater number of politicians become more strongly mobilized by algorithmic election news exposure to participate in the campaign activities ($b = .04$; $p = .032$). Nevertheless, there is no significant moderation effect for the estimated number of politically interested friends in people's networks ($b = .00$; $p = .071$).

Turning to vote choice certainty, we do not find a direct or indirect relationship between most of the studied variables, other than controls (see Table A3 from the Supplementary Files). Just because voters use platforms, follow politicians, or perceive their network as more politically interested does not make them more certain in their vote choice. This result remains the same when we examine the change in vote choice certainty over time (see Table A4 from the Supplementary Files). However, we do find that respondents with higher levels of news curation show lower levels of vote choice certainty in both models. The curation practices, hence, explain a negative slope in the change of vote choice certainty. This finding, however, is independent of the levels of exposure, which speaks for an association between the need to curate and certainty of what vote to cast. We note that the average vote choice certainty was high at both measurement times. Hence, there was little variation in change to explain.

Examining the turnout, we found no direct effect of algorithmic or traditional media use on self-reported voting behavior (Table A5 from the Supplementary File). However, algorithmic election news exposure was related to higher turnout for voters with a network perceived as more politically interested, as evidenced by the moderation analysis ($b = 1$; $p = .019$), while controlling for respondents' political interest. Thus, we observe a networked relationship on turnout at a cross-sectional level. However, when we include the self-reported turnout intention, which is the variable that comes closest to a lagged dependent variable for assessing auto-regressive effects (Table A6 from the Supplementary File), this relationship becomes insignificant ($b = 1$; $p = .153$). In this model, which predicts change between voting intention and actual turnout, we find no variable (studied or controlled) that predicts the change between the intention to turn out and actual, self-reported turnout.

7.2. Polarizing Effects

Turning to polarizing tendencies, we first look at direct, cross-sectional relationships for issue extremity concerning climate change. We find no significant direct relationship between exposure to algorithmic election news and more extreme attitudes on climate change issues ($b = 1.02$; $p = .106$; see Table A7 from the Supplementary File). By conventional standards of significance, we also observe no indirect relationship. The indirect effect of algorithmic exposure and the number of politicians has an error probability of 8.7%. ($b = .98$; $p = .087$; Table A7 from the Supplementary File). This can suggest that algorithmic media use and following more politicians on Facebook is associated with developing more extreme positions on political issues such as climate change. Because attitude reinforcement is constructed based on changes in issue positions over time, no additional auto-regressive analysis was conducted.

Concerning cross-sectional relationships for affective polarization (see Table A8 from the Supplementary File), we find no direct or moderated relationship between election news exposure and the three datafication markers examined. Interestingly, we find a direct relationship between traditional news media use and affective polarization. Users who rely on traditional channels have a higher tendency to dislike political opponents ($b = .09$; $p < .001$), particularly those who are more politically interested ($b = .16$; $p < .001$). When estimating the auto-regressive effects on affective polarization (see Table A9 from the Supplementary File), we again find no indication—direct or moderated—that algorithmic election news exposure influences hostile feelings against opposing parties. However, the change in affective polarization over the campaign period can be partly explained by a small yet significant relationship with traditional news exposure ($b = .04$; $p = .005$). Contrary to previous research, we find a media effect on polarization,

however, not from algorithmic platforms but from traditional modes of exposure.

8. Discussion

The present study tested the role that election news exposure on algorithmic platforms plays for five important outcome variables during an election campaign. We built on the metaphor of algorithmic attractiveness in platform news exposure (Thorson, 2020) and investigated its agentic component by analyzing users' (self-reported) curation and networks, which we treated as indicators of subsequent datafication processes shaping user's attractiveness to news, and guiding the processes of algorithmic curation and information exposure on social media platforms.

We found that users' data footprints, conceptualized as a symbolic representation of the user's inferred preferences based on (in this case, self-reported) datafication markers, can enhance mobilizing tendencies of news exposure on algorithmic platforms during election time, particularly for campaign participation and, to a lesser extent, for turnout. These findings align with prior research that has shown the mobilizing effects of algorithmic election news exposure on algorithmic platforms during election campaigns (Marquart et al., 2020b; Ohme, 2019). Furthermore, active news curation appears to increase participation in election-related activities throughout the campaign. Our failure to find similar effects on turnout may be due to the high levels of turnout intention and actual turnout in our sample. Nevertheless, our finding that a network perceived as more politically interested strengthens the relationship between election news exposure on algorithmic platforms and self-reported turnout aligns with previous research demonstrating that politically active networks are associated with the turnout, regardless of individual interest in politics (Bond et al., 2012).

Regarding attitude reinforcement and affective polarization, our findings contrast with previous research that suggested polarizing tendencies (Ohme, 2021). Instead, our findings align with Beam et al. (2018) in that algorithmic election news exposure did not reinforce attitudes towards one of the most salient and fought-over policy issues during the German *Bundestagswahlkampf* (climate change) and did not lead to the disliking of political opponents. This can be understood as good news for democracy, although we need to consider alternative explanations. For example, Törnberg (2022) argues that digital media engenders an all-encompassing polarization through algorithmic partisan sorting. However, the political situation in Germany is not as divided as in the US, where there is a strong sense of fundamental difference and mutual distrust—or even denial—of the other side's legitimacy (Iyengar et al., 2012; Mason, 2016). In turn, this may shape the quality of algorithmic news exposure in a way that reflects a wider array of cross-cutting conflicts, thereby preventing affective polarization. Therefore, future research should consider the partisanship structure in the political context being studied.

Our findings have two main implications. Firstly, we found no evidence that receiving news on algorithmic platforms during an election campaign reinforces existing attitudes or increases affective polarization. Although we did not analyze exposure to specific content, it seems that while some content received on digital platforms can set reinforcing spirals in motion (Garrett et al., 2014; Lee et al., 2018), looking at more general exposure patterns attenuates the potential danger attributed to social media platforms in stirring up political polarization (e.g., Feezell et al., 2021). Unexpectedly, our results suggest that traditional media use has a small auto-regressive effect on affective polarization, possibly indicating that digital platform news exposure's diversity, randomness, and malleability may be less responsible for polarizing tendencies among the electorate traditional media outlets with a partisan leaning, narrower information and arguments, fixed content, and less personalization. These explanations are speculative, and we suggest that future research remains attentive to such patterns.

Secondly, it is necessary to account for the active role of individual users in shaping their data footprints. Though limited, our evidence shows that news curation, perceived network contacts, and following politicians' accounts can influence mobilization through algorithmic election news exposure. This is one of the first indications that digital footprints, users' active behavioral decisions on digital platforms, are a meaningful input for datafication processes and that these inputs can mobilize. This speaks both for arguments concerning algorithmic dependency (Thorson, 2020; Thorson et al., 2021) and user agency (Marquart et al., 2020a) in constructing a media diet with a positive effect on democracy. However, we caution against overestimating the effect of news exposure and subsequent datafication processes based on the self-reported nature of our data. Additionally, our results suggest that stable traits such as political interest have a greater impact on mobilizing and polarizing outcomes. Although digital platforms may increase individual informedness, their impact on actual outcomes seems limited.

9. Limitations and Outlook

While we underline the importance of this study, we acknowledge its limitations and suggest that these should guide future research on algorithmic attractiveness based on users' self-reports. First, our results beg the question of whether datafication processes can be effectively studied with self-reported survey data. These processes are influenced by a vast number of individual user decisions, such as selections, reactions, and interactions that occur multiple times daily for most platform users. Thus, our approach to operationalizing data footprints via datafication markers is a basic attempt to estimate the outcomes of these processes, and we

operate on a superordinate and error-prone data level. It is unclear whether using digital trace data for such a study would yield more significant effects or null findings. However, our study can provide a foundation for future research to include users' digital trace data, such as screenshot data or data donation packages from platforms, to investigate these processes more granularly (e.g., Araujo et al., 2022; Yee et al., 2022).

Besides the granularity of social media use, self-reports are prone to other recall biases and other types of errors, for example, reverse causality claims. Despite efforts to circumvent this, the low variance in responses regarding voting intention and turnout, for example, may be due to social desirability. Moreover, some frequency measures relied on ordinal scales that may not accurately reflect the relative differences in variables such as campaign participation across individuals. Further, the distribution of some of our measures is not ideal for studying auto-regressive effects, as there was little change between assessments over time. This ceiling effect may cover some of the processes. Related to concrete measures, we were limited to the five most frequently used platforms in Germany at the time of the study. Future research should also study such platform differences and disentangle the relevance of footprints on these platforms.

Lastly, some limitations regarding the sample exist. While our sample has characteristics that are representative of the German population of over-18, it is not a fully representative sample. The extensive quality criteria we used may have led to the systematic exclusion of a subsample. Furthermore, our sample is more highly educated and older than the general German population, which may have contributed to the high scores on variables such as voting intention and the relatively low exposure to algorithmic news media. As a result, our sample is unlikely to fairly represent the behavior of younger citizens in Germany who are known to rely more heavily on algorithmic platforms for news exposure (e.g., Ohme, 2019). Thus, the results can be understood as a conservative test of the relationships.

10. Conclusion

Research and public attention increasingly focus on the algorithmic aspects of social media platforms and their impact on democratic variables such as electoral participation. Counter to dominant narratives suggesting that social media algorithms lead to divided societies and intergroup hostility; we find more evidence for a mobilizing than a polarizing effect of election news exposure on social media platforms. As such, our findings challenge the techno-deterministic view of individuals surrendered to opaque algorithms and speak to the traditional liberal understanding of an agentic individual. However, this interpretation comes with a grain (or a handful) of salt since individuals do not have equal capacities and resources needed to be agentic. Thus, we need to remain

attentive to the inequalities that may be responsible for the fact that the processes we uncovered might work for some users but not all. Finally, we suggest remaining attentive to context-specific outcomes of algorithmic processes, such as the overall nature of partisanship in the studied population. In conclusion, this study presents a modest yet necessary operationalization of a popular metaphor concerning users' interactions with algorithms on social media platforms.

Conflict of Interests

The authors declare no conflict of interest.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors.

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