The Role of Political Activity in the Formation of Online Identity Bubbles

Abstract

Increasing social media use has transformed political participation by creating social cliques and echo chambers, which involve interaction between like-minded people. In this study, we examined the relationship between online political activity and personal involvement in online identity bubbles. This study is the first to examine this phenomenon using nationally representative data; its data were derived from surveys targeted at 18–74-year-old Finns (N = 3,724). Measures included online political activity, the Identity Bubble Reinforcement Scale, and behavioral and demographic factors. The results show that online political activity was positively associated with online identity bubbles. This effect was strong even after controlling for the behavioral and demographic factors. In addition to online political activity, general online activity, online network size, and basic sociodemographic background variables explained variation of involvement in online identity bubbles. However, neither political preference nor political interest had a systematic effect on involvement in online identity bubbles. The findings confirm the theoretical assumption that online bubbles can be captured using subjective survey measures. Political activity appears to be a key factor associated with the strength of the online bubble experience. This finding has significance in the contemporary information society, in which various mundane discussions and cultural disputes become politically tinged.

Keywords: Social media, Social identification, Political activity, Survey

Online Political Activity and Involvement in Identity Bubbles

Increasing social media use has transformed political participation by providing citizens with better opportunities to participate in political discourse and to actuate new social movements (Bennett, 2012; di Gennaro & Dutton, 2006; Ekman & Amnå, 2012; Jost et al., 2018; McGarty, Thomas, Lala, Smith, & Bliuc, 2014). Social media offers a new social context that provides many users with an increased sense of empowerment by aiding them in expressing their opinions (Bimber, Cunill, Copeland, & Gibson, 2014; van Dijk & Hacker, 2018). People believe that they have the ability to influence many private, public, and commercial affairs through social media (Gil de Zúñiga, Copeland, & Bimber, 2014; Gil de Zúñiga, Jung, & Valenzuela, 2012; Warren, Sulaiman, & Jaafar, 2014). However, social media does not necessarily impact forms of conventional political participation (Boulianne, 2015), such as voting or campaigning. In addition, discussions on social media may reduce citizens' participation in offline political discussions (Hampton, Shin, & Lu, 2017). Therefore, the use of social media has remarkable effects on representative social processes in contemporary societies (Gil de Zúñiga, Molyneux, & Zheng, 2014).

Social networks substantially affect the content that people encounter online; online platforms' algorithmic filtering technology further facilitate this process (Bakshy, Messing, & Adamic, 2015). For instance, users tend to prefer information that confirms their preexisting attitudes, as well as social networks that consist of similar-minded individuals (Bakshy et al., 2015; Zollo et al., 2017). This leads to social interactions that are limited to like-minded communication (i.e., echo chambers), thus reducing informational diversity and further polarizing the relationships between social cliques (Boutyline & Willer, 2017; Zollo et al., 2017). Like-minded social cliques also provide prolific platforms for the spread of fake news

and thus could facilitate the success of post-truth politics (Allcott & Gentzkow, 2017; Del Vicario et al., 2016; Zollo et al., 2015).

Researchers have suggested that political fragmentation and polarization have increased on many platforms and in most Western countries (Bright, 2018; Chan & Fu, 2017; Pew Research Center, 2014). Social media use appears to indirectly induce political polarization via increasing political engagement (Lee, Shin, & Hong, 2018; Conover et al., 2011). There is cross-national evidence on the relationship between politics and information search behavior online (Dutton, Reisdorf, Dubois, & Blank, 2017). To our knowledge, however, there are no studies examining the relationship between political activity and the fragmentation of online social networks based on nationally representative data. [R1:5] Because researchers have only used platform-generated data, online panel data, or limited sociodemographic populations (e.g., student samples), it is not clear how significant online fragmentation is as a societal phenomenon.

In this study, we examined the relationship between political participation in social media and citizens' involvement in online identity bubbles. Additionally, we considered the respondents' demographic and behavioral factors and assumed that citizens would tend to form identity bubbles through social media use, as (Keipi, Näsi, Oksanen, & Räsänen, 2017) described in the Identity Bubble Reinforcement Model (IBRM). We analyzed the phenomenon using nationally representative survey data to identify new essential premises for understanding political activism within civic society, as well as this activism's impact on political upheavals.

Identity Bubble Reinforcement Model

Based on various big-data sources, researchers have shown that online social networks are often segregated into social cliques that are characterized by shared worldviews, ideological group memberships, and patterns of information consumption (Bakshy et al.,

2015; Del Vicario et al., 2016; Himelboim, Mccreery, & Smith, 2013). Despite this, individuals vary in their motivations to form like-minded online social ties (Häussler, 2018); social media can also encourage users to find diverse information (Beam, Hutchens, & Hmielowski, 2018). This implies that individual differences in how a person relates to online social networks are crucial to understanding online social phenomena.

The IBRM is intended to provide a better understanding of individuals' tendency to be involved in social cliques or social identity bubbles (Kaakinen, Sirola, Savolainen, & Oksanen, 2018; Keipi et al., 2017). According to this social psychological model, highly personalized, selective, and identity-driven use of social media leads to online identity bubbles. This relationship is reflected in three intercorrelated elements:

- closeness to online social networks (social identification),
- a tendency to interact with like-minded people (homophily), and
- a reliance on information that similar others present online (information bias).

The IBRM, as well as its dimensions of social identification, social homophily, and information bias, are based on the social psychological theory of group behavior. Social identification, one of the classic ideas of social psychology, has been applied in grounded group experiments (Hogg, Abrams, Otten, & Hinkle, 2004; Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). According to social identity theory, individuals' self-concepts are partly determined by their internalized memberships in relevant social groups (Tajfel & Turner, 1979). Online groups have become an increasingly relevant references for social identification, as researchers have noted (Lehdonvirta & Räsänen, 2011; Mikal, Rice, Kent, & Uchino, 2015). People who strongly identify with their online social networks also tend to socially categorize; in other words, in their online interactions, they perceive themselves as online community members instead of as having a personalized identity (Jans, Leach, Garcia, & Postmes, 2014).

Homophily is based on the idea that people are likely to form social relationships with others who are similar to them. Perceived similarity can be based on social and economic status, other background factors, or shared attitudes (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001). Social media, in particular, offers many possibilities for social networking on the basis of similarity (Kang & Chung, 2017; Oksanen, Hawdon, & Räsänen, 2014), and online social networks often form around attitudinal or affective homogeneity (see Robles, Velez, De Marco, Rodriguez, & Gomez, 2018; Zollo et al., 2017).

The information-bias element of IBRM is based on findings that online users are mostly exposed to like-minded information (Bakshy et al., 2015) and that people, in general, are prone to motivated reasoning: perceiving attitude-congruent information as more trustworthy than attitude-incongruent information (Kuru, Pasek, & Traugott, 2017; Westen, Blagov, Harenski, Kilts, & Hamann, 2006). In addition, the algorithmic filtering that social media platforms use can enhance online information bias (Pariser, 2011). Together, selective exposure and motivated reasoning can lead to a situation in which like-minded online networks are a person's major source of information, even when that information is based on rumors or even fabrications (Bessi et al., 2015; Del Vicario et al., 2016).

An identity bubble is essentially a personal tendency to show social identification, social homophily, and information bias in online behavior; it can vary across online users (Kaakinen et al., 2018; Keipi et al., 2017). Thus, this study's approach expands on those of previous discussions on online bubbles by considering not just social networks but also individual users. This approach also helps improve psychological understanding of the research grounded in computer science by focusing on structural measures of online behavior and social networks (Bakshy et al., 2015; Bessi et al., 2015; Del Vicario et al., 2016).

Political Activity Online

Political activity in democratic societies is generally understood as activity that is intended to influence political decisions, thus facilitating governmental actions (Verba, Schlozman, & Brady, 1995). Passive political engagement usually involves voting and the monitoring of political news; active engagement, however, involves participation in political organizations and political movements (Ekman & Amnå, 2012). The online environment adds to the range of possible activities. In the particular context of social media, passive participation can include following a political discussion on a social network, whereas active participation can entail discussing politics, creating political content, or sharing political news on social networks (van Dijk & Hacker, 2018).

We approach passive and active political engagement as they are manifested through social media, including interactive, Internet-based applications such as social networking sites, discussion forums, instant messaging applications, and blogs. By comparison to traditional media, social media has opened more channels for people to find a variety of political content and has also offered direct interactions between citizens and politicians (di Gennaro & Dutton, 2006; Graham, Broersma, Hazelhoff, & van ’t Haar, 2013). Social media is an essential mobilization tool, as it allows for the organization of targeted groups’ political activities but does not require a massive financial investment (Youmans & York, 2012). In addition, social media can be used to exchange emotional or motivational content and can enhance shared identities within political networks (Jost et al., 2018; McGarty et al., 2014).

Researchers have indicated that online political activity, especially on social media, fosters citizens’ social capital, civic engagement, and offline political participation (Gil de Zúñiga, Copeland, et al., 2014; Warren et al., 2014). Among citizens who have wide offline networks (Campbell & Kwak, 2011) or wide online networks (Valenzuela, Kim, & Gil de Zúñiga, 2012), social media positively affects political participation. General activity on

social media is an important factor, as it enables (or even forces) active users to find political content through their networks without actively seeking it (Boulianne, 2015; Pasek, more, & Romer, 2009). Active users are, therefore, passively involved in online politics, even if they do not want to be. Scholars have also suggested that social media generally provides a participation platform for those who are interested in politics to begin with (Boulianne, 2009); therefore, social media has the potential to reinforce inequalities in participation instead of mitigating them.

Demographic factors are also related to the benefits of online participation. Highly educated and wealthy population groups, relative to other groups, have more experience with technology and thus have a greater ability to take advantage of social media (Schradie, 2011; van Deursen & van Dijk, 2013). Young citizens also tend to adopt social media for political purposes, as they favor a self-expressive style of participation to the more formal participation that inflexible party agendas provide (Bennett, 2012; Holt, Shehata, Strömbäck, & Ljungberg, 2013). According to the most recent statistics, in Finland, population-level disparities in the purposes of online activity persist. The use of social networking sites for political purposes is apparently more common among those who are under 55 years old and among those with college degrees than among other demographic groups (Official Statistics of Finland, 2016; Koiranen, Keipi, Koivula & Räsänen, in press).

The lack of constraints on social media use means that social media providers rarely edit content, which allows for relatively broad dissemination of ideas and which provides easy access to those who have opposing points of view (van Dijk & Hacker, 2018). However, the online environment also offers opportunities for selective information exposure and politically motivated reasoning—tendencies that are most prevalent among politically active individuals (Anglin & Jussim, 2017; Lee, Choi, Kim & Kim, 2014; Weeks, Lane, Kim, Lee, & Kwak, 2017). Social media platforms are effective for ideological categorization due to

their propensity to bring together like-minded users (Del Vicario et al., 2016). Researchers have suggested, for example, that Democrats and Republicans were highly segregated on social media during the 2016 U.S. presidential elections (Alashri et al., 2016; Beam et al., 2018); when these separate, ideologically charged cliques interacted, the discussions escalated into severe political conflicts with antagonistic content (Sunstein, 2018, p. 59).

Citizens' political beliefs are highly relevant when trying to understand online social polarization. The traditional, class-based political cleavages have diminished in recent decades, especially in Western democracies. The rise of populism is probably the most visible sign of this change (Inglehart & Norris, 2017). In contemporary multiparty systems, parties can no longer be defined only according to their placement on the left–right spectrum (Oesch & Rennwald, 2018); rather, political parties need to be considered in association with multiple value-dimensional factors (Kriesi, 2010). Social media is an appropriate tool for new political movements to spread their ideologies and to share their goals with broader audiences (Engesser, Ernst, Esser, & Büchel, 2017; Kruikemeier, van Noort, Vliegenthart, & de Vreese, 2013).

Political preferences are embedded in the broader social circumstances of social media. Those who express extreme political beliefs are the most likely to create social cliques with each other, especially on social media, even clique members come from different social backgrounds (Bennett, 2012). Those with the strongest opinions on political issues are relatively immune to the negative impact that social media can have on offline participation, which indicates that groups on the political extremes have benefited the most from social media (Hampton et al., 2017). This notion has indirect implications for how online social bubbles evolve for groups of individuals from the same or different ideological backgrounds.

Hypotheses

The purpose of this study was to analyze relationship between political participation in social media and involvement in online identity bubbles. [R1:1]. Researchers have suggested that the increase in social media use has transformed political participation and limited social interactions to echo chambers and social cliques (Boutyline & Willer, 2017; Zollo et al., 2017), thus increasing political polarization (Bright, 2018; Chan & Fu, 2017) especially among those who are politically active in social media (Lee et al. 2014). Based on the existing literature, our main hypothesis was as follows:

> H1: Among active users, political activity on social media is associated with personal involvement in identity bubbles, including increased tendencies to show social identification, homophily, and online information bias (Kaakinen et al., 2018; Keipi et al., 2017).

We also hypothesized that relationship between the bubble reinforcement and online political activity is associated with the factors of online political activity, namely:

> H 2.1: social media activity (Boulianne, 2015) and size of social media network (Valenzuela et al., 2012);
>
> H 2.2: general interest in politics (Boulianne, 2009) and political party preference (Engesser et al., 2017; Hampton et al., 2017);
>
> H 2.3: socio-demographic factors, such as age, gender and education (Schradie, 2011; van Deursen & van Dijk, 2013; Koiranen et al., in press).

Furthermore, we also aimed to investigate whether each of the three elements of online bubbles (social identification, homophily, and information bias) associate with online political activity. In other words, we tested our hypotheses by examining the three elements separately and in combination.

Method

Participants

Our analyses are based on survey data that we collected from two sources. We distributed the first part by mail to a simple random sample of 18–74-year-old Finnish speakers (8,000 in all). We obtained 2,452 responses, which amounted to a 31% response rate. The second part included 1,200 volunteer respondents (also aged 18 to 74) from a nationally representative online panel that a market-research company administered. Accordingly, the final data set included 3,724 respondents, of whom 66% were from the probability sample. In this study, we focused on social media users, who accounted for 74.4% of the total data. The reason for including responses from the non-probability sample is justified in order to guarantee sufficient number of social media users. Naturally, we considered the potential bias between the samples and provided a robustness check for the main effects by analyzing the two samples separately.

Our descriptive findings suggest that the data generally represent the group of Finnish social media users, although the oldest users are slightly overrepresented (Sivonen, Koivula, Saarinen, & Keipi, 2018). The data also indicate that the nonprobability sample reinforces the demographic representativeness of the probability sample especially in terms of gender distribution; however, the samples differ regarding the qualitative questions, such as interest in various types of news. We also handled the bias regarding the age distribution by using a weighting variable construct to balance the sample's age distribution to correspond with the official population distribution of Finnish social media users according to Official Statistics of Finland (Sivonen et al., 2018).

Measures

We measured involvement in social media identity bubbles with the Identity Bubble Reinforcement Scale (IBRS), and we treated it as a dependent variable. IBRS is a cross-nationally validated measure (Kaakinen et al., 2018) based on the IBRM (Keipi et al., 2017). The scale measures individuals' tendency to become involved in identity-driven social cliques on social media (Kaakinen et al., 2018).The scale consists of six items (see Table 1) and has three subscales: social identification, homophily, and information bias. The items were assessed measured with questions ranging from 1–7, such as "In social media, I belong to a community or communities that are important part of my identity" (1 = does not describe me at all, 7 = describes me completely). **[R2: 3]** The IBRS as a whole and all its subscales have shown good or sufficient reliability (Table 1).

Table 1 about here

Our primary independent variable is a measure of online political activity. This variable involves various types of social media participation, from passive to different levels of activity. We used four single items for the formation of applied variable, namely following political discussions, participating in political discussion, sharing political content, and creating political content. Originally, we asked respondents about their participation in such activities using a 5-point scale, with 1 "Never", 2 "Sometimes", 3 "Weekly", 4"Daily", and 5"Many times per day".

For analysis purposes, we first coded "Inactive" users, who did not use social media for political purposes at all. Secondly, we classified as "Followers" those who only follow political discussions in social media at least sometimes. Thirdly, we differentiated "Occasional participants" who *at least sometimes* used social media for participating in political discussions, creating political content or sharing political content. Finally, we established "Active participants", who *at least weekly* used social media for participating in

political discussions, creating political content or sharing political content. In all, 27.4% of the users of social media were inactive, 29.9% were followers, 32.8% were occasional participants and 10.0% were active participants.

To better estimate the significance of this online political activity, we accounted for factors that could confound the effect of online political activity. According to the presented literature, we assume that users' social media activity (Boulianne, 2015) and size of social media networks (Valenzuela, Kim, & Gil de Zúñiga, 2012), interest in political affairs (Boulianne, 2009) and political party preference (Engesser, Ernst, Esser, & Büchel, 2017) may influence the revealed associations. We also controlled for the effects of three basic sociodemographic background variables, namely gender, age, and education, that contribute to online political activity (Koiranen et al., in press; Official Statistics of Finland, 2016) and may generally separate users' in terms of social media use-purposes (Schradie, 2011; van Deursen & van Dijk, 2013).

To account for the effect of active social media usage, we controlled for the participants' activity in social media discussions. Initially, we measured participation in such discussions by asking how often the respondents participated in such discussions using a 5-point scale, with 1 "Never", 2 "Sometimes", 3 "Weekly", 4"Daily", and 5"Many times per day". Due to variable skewness, we then categorized this activity by differentiating those who never participate (1) from those who participate sometimes (2) and those who participate at least weekly (3). We measured the size of a participant's social media network using the initial question "To what extent do you have friends and acquaintances on social media?"; the answer options ranged from 1 (*not at all*) to 5 (*very much*). This variable was normally distributed, and we used it as a continuous variable in our further analyses.

We measured interest in political affairs by the respondents' self-ratings of their interest in politics. The scores, which ranged from 0 (*very little*) to 10 (*very interested*), were

used as a continuous variable. We defined political preference by determining the political party that the respondents felt most closely matched their beliefs. In analyses, we focused on the six largest parties: the Centre Party of Finland, the National Coalition Party, the Finns Party, the Social Democratic Party of Finland, the Green League, and the Left Alliance. Due to a lack of data, the supporters of other parliamentary parties—the Swedish People's Party, the Christian Democrats, and the Blue Reform—were grouped with other minor parties in the Other category. In addition, we grouped those who did not prefer any party in the None category. We held the supporters of the populist party (the Finns Party) as a reference category by omitting it from the final models. In this way, we were able to evaluate the extent to which supporting the traditional major parties or other parties affected participants' involvement in social media identity bubbles, as compared to supporting the Finns Party.

Concerning sociodemographic variables, we determined the respondents' age via an open-ended question in which the respondents reported their year of birth. We categorized the respondents' education following the basis of the International Standard Classification of Education. Appendix 1 provides information on the measurements and descriptive statistics for all the independent variables. The categorizations and descriptive statistics of the applied independent variables are shown in Table A1.

Statistical Techniques

In the first phase of the empirical study, we assessed the direct effect that online political participation had on bubble formation by analyzing whether background factors affected this association. We also tested the sample effect by using separate models for the probability and nonprobability samples. Finally, we formed a similar model for each subscale. To gain a better understanding of the variance across subscales, we used *Z*-standardized values for each dependent variable.

We conducted the statistical tests using ordinary least-squares models. We estimated the decomposition effects with Sobel-Goodman mediation tests. We tested the effects of confounding variables on associations between active online participation and identity bubble reinforcement in a step-by-step manner and held the other background variables as covariates. We performed the analyses with Stata 15 (utilizing the KHB package) and illustrated the results using the user-written coefplots package (Jann, 2014) and graphic schemes (Bischof, 2017).

Results

The results regarding our first hypothesis are shown in Figure 1 and Table A2. Occasional (B = 4.77, p < .001) and active (B = 5.76, p<.001) online political participation had substantial effects on involvement in identity bubbles. Following political content also positively predicted identity-bubble reinforcement (B = 1.87, p < .001).

Figure 1 about here

As Figure A1 shows, active political participation had similar effects on the probability sample (B = 5.78, p < .001) and the nonprobability sample (B = 5.43, p < .001).

Next, we added the covariates to the base model. The covariates significantly confounded the association with active online participation (B = 2.63, p < .001). However, the adjusted effect of active online participation remained significant (B = 3.13, p < .001). The final model predicted identity-bubble reinforcement relatively well (R^2 = .182).

The results of the decomposition analysis are shown in Figure 2. Social media activity was the most significant factor of the association between active online participation and identity-bubble reinforcement (B = 1.19; p < .001). Size of social media networks was also significantly contributing to the association between active online participation and identity-bubble reinforcement (B = 0.99, p < .001). Age (B = 0.20, p < .05) and gender (B= 0.18, p<0.05) also were significantly confounding the revealed effects. Interestingly, education,

interest in political affairs and political party preference did not confound the effect of political activity.

Figure 2 about here

The direct effects of the covariates are shown in Table A2. Age had a negative effect on identity-bubble reinforcement (B = –0.052, p < .001), and women were more disposed to reinforcement than men (B = 1.10, p < .001). The strongest predictor was participation in online discussion (*sometimes*: B = 1.35, p < .001; *at least weekly*: B = 2.05, p < .001). The size of the participants' social networks was also positively related to identity-bubble reinforcement (B = 1.81, p < .001). Party preference had a small effect, as the supporters of the Centre Party had a significant effect when the supporters of the Finns Party were omitted. Interestingly, education, and interest in political affairs did not have a significant effect on identity-bubble reinforcement.

Next, we formed similar models for each subscale. To understand how online participation affected each subscale, we *Z*-scored the dependent variables before creating the ordinary least-squares models. Figure 3 shows the main results for the models in Table 2.

Figure 3 about here

The significant effect of active online political participation held true for each subscale (identification: B = 0.95, p < .001; homophily: B = 0.17, p < .05; information bias: B = 0.73, p < .001). Controlling for background variables also had significant effects on each subscale. However, the effect of online participation remained significant in the identification (B = 0.46, p < .001) and information bias (B = 0.48, p < .001) subscales, even after controlling for the background variables. However, for homophily, after the addition of the covariates to the model, the effect of political activity shrank into insignificance.

According to the decomposition analysis, age confounded the effect of active online participation on identification (identification: B = 0.02, p < .05) and information bias

($B = 0.03$, $p < .03$). The effect of active online participation was also confounded by social media activity when predicting identification ($B = 0.28$, $p < .001$) and information bias ($B = 0.08$, $p < .01$). Size of social media network confounded the effects of active online participation in each subscale (identification: $B = 0.15$, $p < .001$; homophily: $B = 0.06$, $p < .01$; information bias: $B = 0.11$, $p < .001$). In addition, neither education, interest in political affairs nor political preference had confounding effects on the subscales.

The direct effects of the covariate variables are shown in Table 2 They were mainly similar in the subscale analysis and in the comprehensive scale analysis of identity-bubble reinforcement. For each subscale, age had an adverse effect, and size of social media network had a positive effect. Education had a significant positive effect on identification but did not have this effect on other subscales. The gender effect was prominent for identification and homophily but not for information bias. Interestingly, social media activity was not associated with homophily even though it had substantial effects on the other subscales. Party preference had a slight effect on identification, as the supporters of the Centre Party, the National Coalition Party, and the Green League generally had significant scores when the supporters of the Finns Party were omitted.

Table 2 about here

Discussion

In this study, we examined relationship between political participation in social media and involvement in online identity bubbles among Finnish adults. This study is the first comprehensive investigation of this phenomenon to use nationally representative data. Although all our measures were based on subjective ratings, this study still contributes to an obvious gap in the research literature, which has been primarily focused on social network analysis of discrete social media platforms. This study also serves as an empirical test of a

survey item that has been proven to capture the key dimensions of online bubble formation. In addition, this is the first study to focus on online political activity and its role in the process.

Our main hypothesis (H1) was that online political activity would increase the likelihood of bubble formation. Additionally, we expected that the association is related to general social media activity and social media network size (H 2.1), interest in political affairs and political party preference (H2.2), and sociodemographic factors, such as age, gender, education (H2.3). Our analysis partly supported these hypotheses. Regarding H1, our findings do positively associate online political activity with online identity bubbles. Our additional analysis shows that online political activity's impact on various IBRS subscales varied. Regarding H2, our analysis of the additional predictors' confounding effects shows that age, gender, social media activity, and size of social media network had significant effects. These effects are almost identical for each subscale; however, they do not entirely explain the effect of political activity.

Researchers have suggested that the most politically active individuals are also the most prone to ideologically motivated reasoning and selective online-information exposure (Anglin & Jussim, 2017; Weeks et al., 2017). Our findings complement this theory by showing that the most politically active online users were also the ones who were most likely to be involved in online identity bubbles, to show strong social identification, and to exhibit information bias in social media. Political networks on social media provide mobilization and organization but can also enhance shared worldviews, identities, and emotional states (Jost et al., 2018; McGarty et al., 2014). Our results imply that this social dynamic can be a significant factor in the creation of online social bubbles.

The respondents' political interest and political preference, however, were not associated with online identity bubbles. This can be considered as surprising as earlier

research has indicated that both political interest is a significant factor in social media behavior (Boulianne, 2009) and social media is a beneficial interaction forum for extreme political groups especially (Hampton et al., 2017). Our results suggest, however, that it is political activity, not political interest or certain party affiliations, that are related to online social cliques **[R1:6]**.

Citizens form online networks with politically similar people, and these networks increasingly differentiate themselves from opposing clusters. Online politics also seems to reinforce opinion barriers—an effect that has a reduces constructive social debate, as (Sunstein, 2018) observed with regard to the recent U.S. elections. As social media has made political controversies increasingly visible, many people now choose to refrain from political discussions in offline contexts due to the presence of non-like-minded others (Hampton et al., 2017). From this perspective, online identity bubbles can function as psychosocial safe havens for politically active individuals. Users can limit the negative consequences of political activity by exposing themselves mainly to similar social content and like-minded information sources.

Our research is based on cross-sectional survey data from a country with a relatively specific multiparty system. We, therefore, must be careful in generalizing our findings beyond the Finnish (or, at least, Nordic) context. In addition, for our subjective measures, we relied on the measurement of online bubbles. If we had instead relied on structural social network measures, for example, this study might have produced different insights. However, the survey instrument that we used in this study has been proven to overcome some of the limitations of social network-based analysis, which has thus far been mostly limited to specific social media platforms and discussions (Kaakinen et al., 2018). Finally, we need to be cautious regarding how we defined online political activity in this study. Social-cohesion arguments present concerns such as that political participation is increasingly shifting away

from traditional methods and toward the digital environment—and social media in particular (see also Hampton et al., 2017).

Overall, the findings show that online political activity, frequent use of social media, and the size of social media networks have an independent effect on identity-bubble formation. These three factors often have a complementary effect, but none of them should be considered as the primary source of online bubble formation. Hence, we emphasize that people are involved in social media cliques for various reasons; political activity is just one of them. In future studies, researchers should further examine the motivations for online bubble development.

Conclusion

This study's results confirm the hypothesis that involvement in online identity bubbles can be captured using subjective measures within social surveys. Political activity appears to be associated with the strength of the online identity-bubble experience. This finding has significance in the contemporary societies, in which many mundane discussions and cultural disputes are taking places online and become increasingly politically tinged. Online bubbles apply similarly across the political spectrum. Therefore, citizens' political bubbles are distinguished by differences in their political activity levels (and the confounding factors that contribute to those differences) rather than by the contributions of their personal ideologies to their attitudes and dispositions.

Data availability

The survey data used in this study will be made available through via Finnish Social Science Data Archive (FSD, http://www.fsd.uta.fi/en/) after the manuscript acceptance. The data are also available from the authors on scholarly request.

Software information

Analyses were run with Stata 15.1. The code is also available from the authors on request for replication purposes.

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Appendix1

Table A1 about here

Table A2 about here

Figure A1 about here

Table 1

Item Formulations and Reliability Coefficients for IBRS and Its Subscales

	M	*SD*	Range	α
Involvement in online identity bubbles	19.82	7.48	6-42	0.84
Identification	7.90	3.87	2-14	0.91
In social media, I belong to a community or communities that are an important part of my identity.				
In social media, I belong to a community or communities that I'm proud of.				
Homophily	6.09	2.92	2-14	0.81
In social media, I prefer interacting with people who are like me.				
In social media, I prefer interacting with people who share similar interests with me.				
Information bias	5.83	2.46	2-14	0.69
In social media, I trust the information that is shared with me.				
In social media, I feel that people think like me.				

Note. N = 2,615.

Table 2 *Predicting Identification, Homophily and Information bias according to Online Political Activity and Covariates*

	Identification				Homophily				Bias			
Variables	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Online political activity												
Inactive	*omitted*											
Follower	0.307***	.053	0.125*	.051	0.107	.057	0.065	.059	0.268***	.052	0.147***	.054
Occasional participant	0.743***	.048	0.353***	.053	0.185***	.052	0.116	.064	0.506***	.049	0.284***	.059
Active participant	0.956***	.064	0.460***	.077	0.153*	.070	0.128	.089	0.722***	.068	0.481***	.084
Age			-0.005***	.001			-0.004**	.001			-0.008***	.001
Education												
Primary			*omitted*									
Secondary			0.069	.067			0.035	.083			0.042	.076
Bachelor			0.215***	.066			0.065	.081			0.062	.075
Master			0.151***	.070			0.132	.087			0.018	.080
Female			0.142***	.036			0.099*	.041			0.072	.039
Participation online discussion												
Never			*omitted*									
Sometimes			0.250***	.043			0.025	.050			0.142***	.046
At least weekly			0.487***	.048			-0.067	.055			0.142***	.052
Size of social media networks			0.266***	.021			0.104***	.025			0.211***	.023
Interest in political affairs			0.003	.007			-0.016	.009			-0.013	.008
Political preference												
The Finns Party			*omitted*									
The Centre Party			0.274**	.088			0.020	.108			0.135	.098
The National Coalition Party			0.103*	.081			0.008	.100			-0.050	.089
The Social Democratic Party			0.104	.086			-0.204	.103			-0.079	.092
The Green League			0.201*	.083			-0.038	.100			-0.042	.090
The Left Alliance			0.083	.098			-0.106	.117			-0.150	.109
Other			0.048	.096			-0.196	.117			-0.084	.104
None			0.125	.080			-0.144	.098			-0.120	.086
R-squared	.110		.256		.005		.034		.055		.134	

Note. The coefficients are *Z*-standardized. $N = 2{,}615$

* $p < .05$. ** $p < .01$. *** $p < .001$.

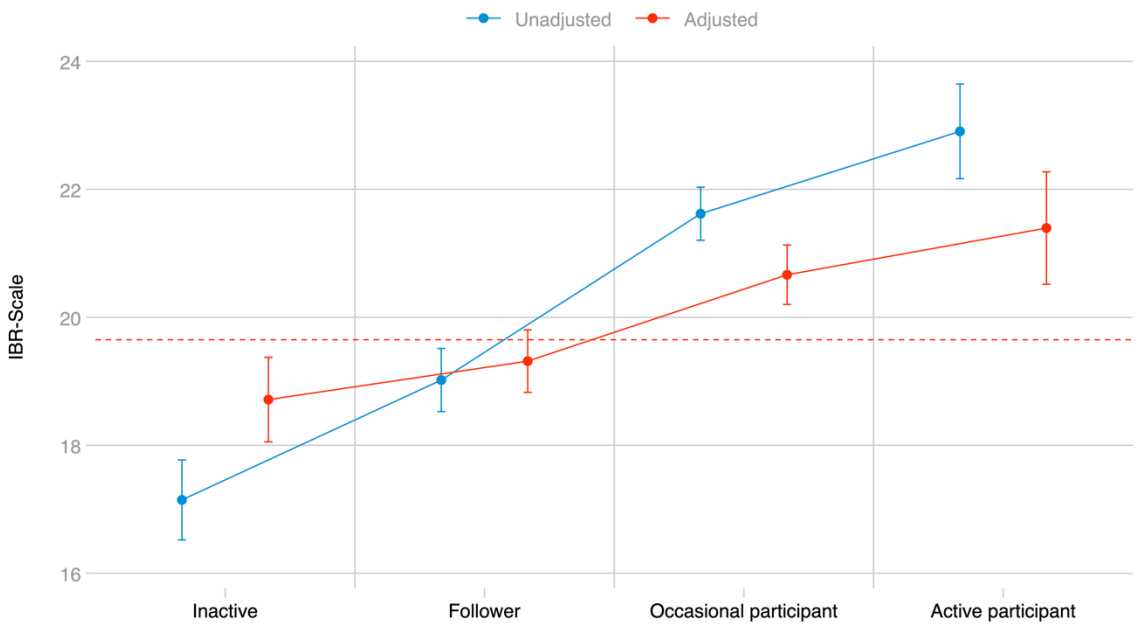

Figure 1. Involvement in identity bubbles according to political activity on social media, with unadjusted and adjusted predictive margins and confidence intervals. The covariate effects are shown in Table A2.

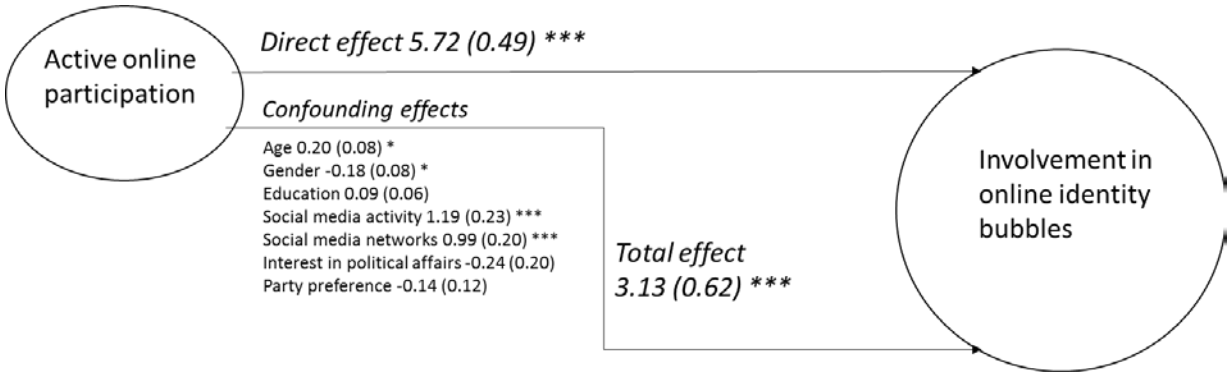

Figure 2. Predicting involvement in online identity bubbles according to active online participation (with confounders). The results are given as regression coefficient (standard error), and the statistical significance is given as * $p < .05$ or *** $p < .001$. The covariate effects of the confounding variables are shown in Table A2.

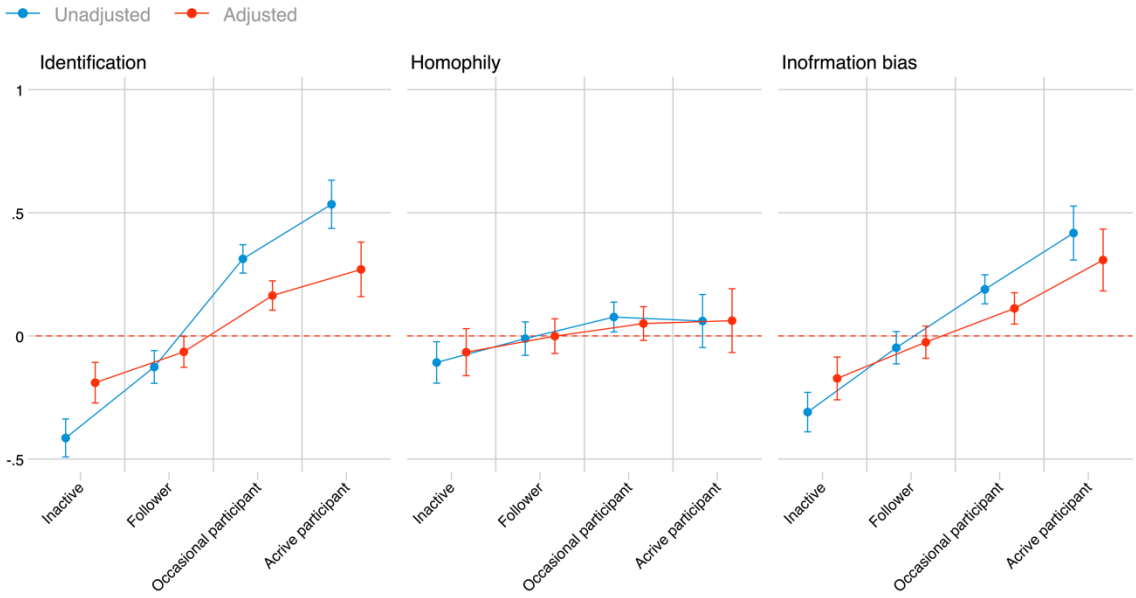

Figure 3. Identification, homophily, and information bias according to political participation on social media, with unadjusted and adjusted *Z*-standardized means and confidence intervals.

Appendix

Table A1

Independent Variables	Total data				Probability sample				Non-probability sample			
	n	%	*M*	*SD*	*n*	%	*M*	*SD*	*n*	%	*M*	*SD*
Online political activity												
Inactive	694	26.5			477	29.2			217	22.0		
Follower	783	29.9			542	33.2			241	24.5		
Occasional participant	870	33.7			509	31.2			361	36.7		
Active participant	268	10.3			104	6.4			164	16.7		
Gender												
Male	1,245	47.6			704	43.2			541	55.0		
Female	1,369	52.4			927	56.8			442	45.0		
Age			47.6	15.8			47.4	16.0			47.8	15.3
Education												
Primary	221	8.4			166	10.7			55	5.6		
Secondary	849	32.5			544	33.3			305	31.0		
Bachelor’s	915	35			554	34.0			361	36.7		
Master’s	630	24.1			368	22.6			262	26.7		
Participating in online discussion												
Never	1,161	44.4			768	47.1			393	40.0		
Sometimes	775	29.6			459	28.1			316	32.2		
At least weekly	679	26			405	24.8			274	27.9		
Size of social media networks			2.9	0.9			2.9	0.9			2.9	0.9
Interest in political affairs			5.8	2.7			5.5	2.7			6.3	2.7
Political preference												
The Centre Party	268	10.3			176	10.8			92	9.4		
The Finns Party	158	6			82	5.0			76	7.7		
The National Coalition Party	504	19.3			327	20.0			177	18.0		
The Social Democratic Party	321	12.3			201	12.3			120	12.2		
The Green League	434	16.6			277	17.0			157	16.0		
The Left Alliance	176	6.7			97	5.9			79	8.0		
Other	177	6.7			91	5.6			86	8.8		
None	577	22.1			381	23.4			196	19.9		
N	2615				1632				983			

Notes. N = valid response on all measures.
M = Mean
SD= Standard deviation
n = observations per group
% = Proportion

Table A2. Predicting involvement in identity bubbles according to online political activity and covariates, unstandardized coefficients (*B*) with standard errors and statistical significances.

Variables	*B*	*SE*	*B*	*SE*
Online political activity				
Inactive	*omitted*			
Follower	1.98***	.390	0.882*	.410
Occasional participant	4.52***	.369	2.283***	.444
Active participant	5.72***	.478	3.132***	.616
Age			–0.052***	.009
Education				
Primary			*omitted*	
Secondary			0.492	.580
Bachelor			1.233*	.572
Master			1.071	.075
Female			1.101***	.284
Participation online discussion				
Never			*omitted*	
Sometimes			1.348***	.345
At least weekly			2.054***	.377
Size of social media networks			1.813***	.171
Interest in political affairs			–0.074	.060
Political preference				
The Finns Party			omitted	
The Centre Party			1.489*	.726
The National Coalition Party			0.716	.657
The Social Democratic Party			–0.291	.695
The Green League			0.569	.657
The Left Alliance			–0.350	.794
Other			–0.527	.784
None			–0.170	.649
R-squared	.073		.182	

Note. N = 2,615 .
* $p < .05$. ** $p < .01$. *** $p < .001$.

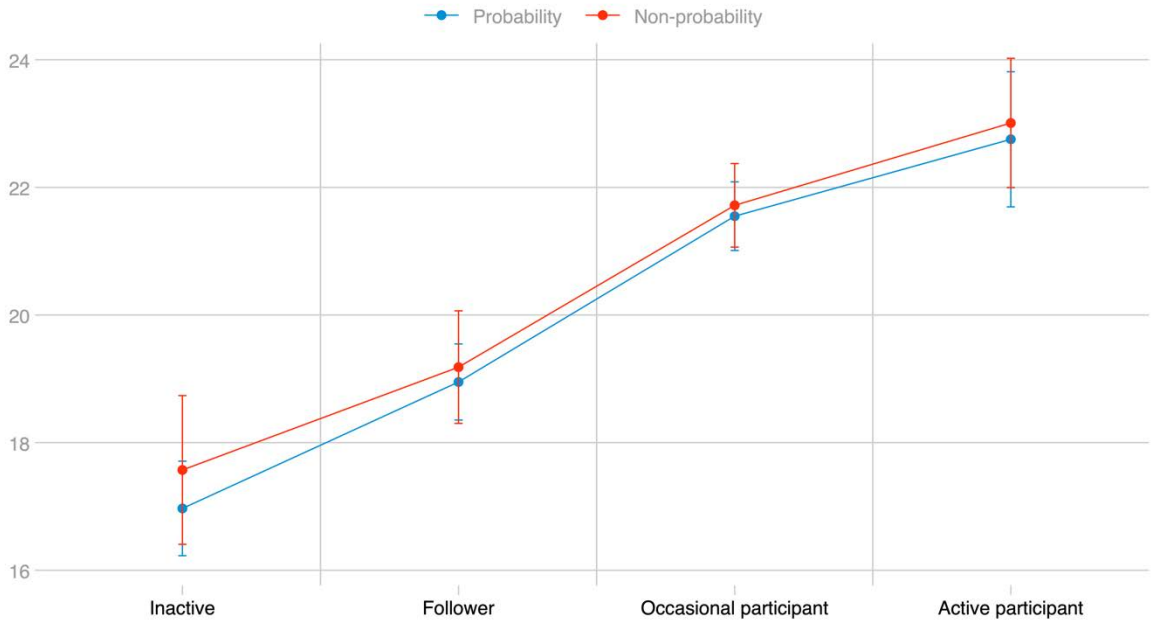

Figure A1. Robustness analysis for the main effect based on sampling method.