
Self-censorship, Polarization, and the 'Spiral of Silence' on Social Media

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Abstract

The spiral of silence theory states that individuals are more likely to self-censor their political views when they believe there is a disagreeable opinions climate. Social media provides new opportunities for people to express political opinions, and learn about the opinions of others, which could amplify the process. We propose that citizens expressing their political views on social media is an important component of contemporary political deliberation, meaning that the exacerbation of self-censoring behaviour poses a threat to democracy. Drawing on nationally representative surveys of online adults in France, Germany, UK and US we explore the existence of a spiral of silence on social media. Using hierarchical multiple regression models, we consider how the perceived opinion climate, political interest and ideology, and how people use social media, predicts self-censoring political opinions on social media. We find statistically significant, support for the spiral of silence on social media, and that political interest is significantly positively related to self-censorship in some countries, and not in others. Place on the political spectrum is not related to self-censorship in any country, but, the perceived importance of social media for politics is a significant and positive predictor of self-censorship across all four countries. These findings signal the continued relevance of the spiral of silence and the importance of considering individual agency in terms of how people choose to use social media for political communication. We also argue further cross-national comparisons are required.

Introduction

In a democracy the opportunity to speak freely and contribute to political deliberation is crucial (Dahlgren, 2005) yet people need to make choices about when and what political information to share. Among other factors, an individuals' perception of the opinion climate, has been shown to influence self-censorship creating a spiral of silence where people choose not to share their opinions if they believe most people do not agree with them (Noelle-Neumann, 1984). This has been true in a mass media environment, and in a high-choice media environment with increased opportunity to express political opinions online, particularly within niche communities (Aelst et al., 2017), the spiral of silence could be amplified.

The spiral of silence is a well-studied theory of media effects on public opinion which states that people decide whether to speak out about issues based on how they observe the climate of opinion (Noelle-Neumann, 1984). If one believes their opinion to be that of the majority in a social setting, they will be more likely to express it, while if they feel others disagree, they will be more likely to self-censor. This process of opinion expression creates a situation in which certain opinions appear to be more publicly acceptable than others, thus reinforcing majority views, while silencing others. There is a risk that the spiral of silence, by effectively limiting the range of publicly expressed opinions, will reduce public discourse which would threaten democratic systems (Dahlgren, 2002, 2005) and could lead to political polarization (Sunstein, 2017).

The spiral of silence theory holds true in various offline (Gearhart & Zhang, 2018; Glynn et al., 1997; Matthes, Morrison, & Schemer, 2010; Noelle-Neumann, 1977, 1984) and online settings (Gearhart & Zhang, 2014, 2015; Hampton et al., 2014; Hampton, Shin, & Lu, 2017; Kwon et al., 2015; Liu, Rui, & Cui, 2017; Malaspina, 2014; McDevitt, Kioussis, & Wahl-Jorgensen, 2003.; Pang et al., 2016; Schulz & Roessler, 2012). The perceived opinion climate continues to have a small, but

statistically significant, impact on people's willingness to express their opinions publicly. However, there has been a shortage of research that examines the spiral of silence cross-culturally (Scheufele & Moy, 2000). Furthermore, the theory has been critiqued for assuming a passive audience that is universally influenced by the opinion climate that they observe, thereby ignoring how an individual's choices and personality impact how they choose to express themselves publicly (Hayes, Glynn, & Shanahan, 2005; Lasorsa, 1991).

Given what we know about the spiral of silence, this paper examines whether this theoretical relationship between perceived public opinion and self-censorship holds true on social media. We also investigate the impact of political interest and ideology on self-censoring on social media. Finally, we consider people's agency in how they decide to make use of social media. We consider how the decisions people make when using social media impact their likelihood of self-censoring political opinions. Through this analysis, we aim to identify individual level factors that explain self-censorship. We take a cross-cultural approach to our study of the spiral of silence, drawing from a representative survey of online adults in France, Germany, UK and US and use hierarchical multiple regression models to examine the degree to which perceived public opinion climate, political interest and ideology, and strategic uses of social media, predict self-censoring.

Literature Review

The spiral of silence was originally used to explain opinion expression in offline, face-to-face settings, with the mass media being central for informing public opinion. However, the media environment has evolved. The high choice environment, and social media, offer new opportunities to not only share one's own political opinions but also to learn about the opinions of others (Aelst et al., 2017). Thus, we have reason to believe that the spiral of silence may continue and could even be amplified. We propose political interest and place on the political spectrum will further help to predict self-censoring on social media. We also consider how the choices people make regarding how they use social media impacts self-censoring.

The Spiral of Silence and Self-Censoring

Spiral of silence theory states that in an agreeable opinion climate, one is more likely to feel confident expressing one's views, however, in conflicting situations one may self-censor for fear of social isolation or punishment (Malaspina, 2014; Noelle-Neumann, 1974, 1977, 1984). According to this theory, the perception of one's social environment is important for determining whether to self-censor. This theory is based on the view that in conflicting situations, people avoid expressing their unpopular opinions for fear of sanctions and isolation (Neubaum & Krämer, 2018). A small, but statistically significant relationship between perception of the opinion climate and willingness to self-censor has been found in numerous studies (Glynn et al., 1997).

The spiral of silence helps to explain individual decisions to self-censor, or express, political opinions and it also has implications for public opinion on a grand scale. The *spiral of silence* process refers to a situation in which many people self-censor, causing the opinion climate to appear increasingly homogeneous, thus reinforcing a dominant opinion (Noelle-Neumann, 1984). When people decide to self-censor based on their understanding of the distribution of public opinion, the dominant opinion appears to become stronger and is displayed more in public. In other words, an opinion that is reinforced by the public opinion appears stronger than it is, until one opinion is established as the prevailing one, and others appear to be rejected by everyone, with the exception of the 'hardcore' who continue to express their opinion regardless of the perceived opinion climate (Noelle-Neumann, 1977).

However, self-censoring behaviour remains complex and is not completely explained by the opinion climate. Self-censoring is also influenced by the strength of views individuals hold (Matthes et al., 2010), fear of potential sanctions (Neubaum & Krämer, 2018), whether individuals perceive their views as becoming more or less popular (Noelle-Neumann, 1984), as well as factors such as

personality (Hayes et al., 2005a; Hayes et al., 2005b; Matthes et al., 2012), political interest (Lasorsa, 1991), and culture (Scheufele & Moy, 2000), as well as the issue being used to test the theory (Gearhart & Zhang, 2018).

Self-Censoring, a High-Choice Media Environment, and Democracy

Democracies thrive when citizens are able to share their opinions freely and in the case of deliberative democracy, cross-pollination and even disagreement among citizens with conflicting views is crucial to a functioning system (Dahlgren, 2005). When individuals choose to self-censor they are limiting their own political speech. This does not necessarily threaten democracy but it can have meaningful consequences for perceptions of public opinion, political decision making, and policy development. Consider the spiral of silence, if individuals are exposed to disagreeable opinion climates they may be less likely to share their own views, leading certain political opinions to be overrepresented, and others to be invisible. In an online context this can be exacerbated depending on how individuals choose to use the media they have available to them.

The introduction of social media and other communication channels have created a high choice media environment which can support sharing of opinions, discussion and debate (Aelst et al., 2017). There are now more ways to share political opinions and more ways to learn about the opinions of others. A wider range of media outlets and social media can allow people to access diverse sources of information and a wide range of political opinions (Kim, 2011; Lee et al., 2014). However, there are also more opportunities to choose what opinions to share and with whom, and what information to access and from who. As Sunstein argues (2017), individuals may choose to use social media, for example, to engage in political opinion sharing, or they may choose to use it in a way that avoids political content altogether. They may also choose to share opinions only within certain niche communities which can often be found on social media platforms. If the spiral of silence theory holds true in these online settings and individuals increasingly self-censor within niche communities, it is possible that certain views will become inflated, leading to fragmentation and more extreme, polarized, opinions (Stroud, 2010).

There are negative ramifications of political polarization. Polarization along ideological lines could exacerbate existing social tensions and serve to isolate people from other ideas. Studies have found that exposure to “cross-cutting” political information tends to lessen political participation (Mutz, 2002) while others cite the importance of exposure to dissimilar views for depolarization (Bimber, 2004; Papacharissi, 2002). Considering the democratic context specifically, deliberation theorists argue exposure to disagreeable political views tends to promote critical thinking and discussion (Delli Carpini, Cook, & Jacobs, 2004), this encourages people to consider opposing views and ultimately come to consensus through deliberation and the modification of their own views (Gutmann & Thompson, 1996; Habermas, 1989).

For example, take the theory of a public sphere which is a communicative space in a society that allow people to circulate information and ideas, deliberate with one another, and formulate political will in the form of public opinion (Dahlgren, 2005). Habermas (1996) suggests that the public sphere serves the function of a “sounding board” in which citizens can articulate opinions about political issues that governments address. Although it is debatable if social media is a public sphere (Papacharissi, 2002), political deliberation online is important because it allows citizens to discuss politics, raise issues, and also, to attract the attention of journalists and governments. Polarization can limit the ability of citizens to engage in such deliberations

That said, polarization can also serve a useful political purpose precisely because the information individuals encounter in polarized environments is less heterogenous. Exposure to ‘cross-cutting’ views (i.e. political disagreement) in one’s network can make people less likely to participate in politics (Lu, Heatherly, & Lee, 2016; Mutz, 2002). Indeed, having disagreement in political discussions inhibits both offline and online political participation (Hampton et al., 2017; Lu et al., 2016). While self-censoring threatens certain democratic deliberation models, there is also

the possibility that this kind of activity could help individuals remain politically engaged. Encountering disagreement online has been shown to disincentive political participation (Mutz, 2002), therefore, we have reason to believe that people avoiding disagreement may lead them to continue being engaged and informed. For example, if you are a politically-engaged person with left-leaning views, you may avoid engaging in online political conversations with your right-leaning Facebook contacts in an effort to avoid disagreeable and uncomfortable conversations. In this situation censoring your views in certain online settings could be good for one's engagement with politics, as one could instead engage in productive political conversations in alternative settings.

Political polarization then has both positive and negative potential ramifications for democracy. Likewise, there are both risks and opportunities that come with self-censorship and the spiral of silence. It is therefore important to understand when and why individuals self-censor. Since social media are frequently thought of as being particularly likely to enable political polarization and since political discussion proliferates across social media internationally (Anduzia, Jensen, & Jorba, 2012; Gil, Jung, N, & Valenzuela, 2012; Graham et al., 2013), it is useful to examine self-censorship practices and the spiral of silence on social media.

The Spiral of Silence on Social Media

Social media can provide spaces for discussion in which people with views not held by the majority may feel free to express their opinions publicly, thus broadening and diversifying public discourse, and adding new perspectives to the discussion of political issues. By providing new opportunities to share and discuss political information, social media poses a challenge to the original spiral of silence theory. Given the ability of social media to present users with diverse political opinions (Kim, 2011; Lee et al., 2014), there has been great interest in testing the spiral of silence in online settings. In a comparative study on spiral of silence in offline and online settings Hampton et al. (2014) found that people are less likely to discuss controversial issues on social media than they were in person. This study used the Snowden-NSA story as a case study and observed that while people were less likely to discuss the story online, in both online and offline settings they were more likely to discuss it if they felt other people agreed with them (Hampton et al., 2014).

The spiral of silence has been investigated in numerous online settings. Studies find small, but statistically significant, support for the theory, with many intervening and moderating factors. Gearhart and Zhang's (2015) study of the spiral of silence on social media found that encountering agreeable political posts on social media predicted speaking out and seeing disagreeable content predicts self-censoring. The notion of 'self-presentation concern' on Facebook was investigated by Liu, Rui, and Cui (2017), who found that Facebook users who were more concerned with their public image were more likely to self-censor their opinions on Facebook (Liu et al., 2017). Based on our review of previous spiral of silence studies, in both offline and online settings, we hypothesize that people who believe that their online contacts disagree with their political opinions will be more likely to self-censor. This is in line with foundational studies of the spiral of silence.

H1a: Users who perceive a disagreeable opinion climate, evidenced by their belief that they do not hold similar political views with their online contacts, will be more likely to self-censor.

We also consider how noticing that one's friends have different political views than expected based on social media posts, impacts self-censorship. We propose that being surprised by other people's political views on social media points towards an unstable opinion climate. Noelle-Neumann (1974) states that the opinion climate is particularly important in "changeable circumstances" (p. 42) in which political opinions appear to be in flux and there is a struggle between conflicting positions. In these situations, the individual must consider where they stand. If they are certain that their opinion agrees with the prevailing one, they are less likely to self-censor.

However, if there is great uncertainty about the opinion climate, they will be more likely to self-censor. While this instability has typically been linked to political turmoil or political issues which are evolving, we contend the new availability of constant information about the views of others on social media could create similar feelings of uncertainty which too would result in self-censorship. By considering the degree to which individuals are surprised by the political opinions they see on social media, we can uncover how an unstable opinion climate on social media influences the decision to self-censor. We suggest that noticing surprising political opinions on social media signals an unstable opinion climate, and therefore will be positively related to self-censoring.

H1b: Users who notice, based on something posted on social media, that their friends have different political views than what they expected will be more likely to self-censor.

Political Interest and Self-Censoring

'Hardcore' individuals, will express their political opinions regardless of how they perceive the opinion climate. The more certain and strong people's views are, the more likely they are to express them publicly (Baldassare & Katz, 1996; Lasorsa, 1991) which complicates the spiral of silence theory. Matthes, et al. (2010) conducted three surveys to test this claim, and found that, indeed, the climate of opinion only predicts opinion expression for people with low or moderate certainty. For individuals with high attitude certainty ('the hardcore'), no such spiral of silence effect is found (Matthes et al., 2010). We expect similar effects will be found in relation to people's political interest and self-censoring behaviour on social media.

General political interest may affect the likelihood of self-censoring. Noelle-Neumann's (1974) spiral of silence theory recognizes the complexity of the process by which people decide to express their political opinions, stating that the degree of interest individuals have in particular issues will impact their decision to speak out or self-censor. The original theory states that both people who are, and aren't, interested in the issues at hand will self-censor. However, those who are more interested in the issues will be less likely to self-censor based on how they perceive the climate of opinion (Noelle-Neumann, 1974, 1984). This is not surprising, because, generally speaking, people tend to discuss subjects that interest them, providing an added incentive to discuss politics (Garramone, 1985). Thus, when controlling for other factors, people who are particularly interested in politics will be more likely to discuss politics, and less likely to self-censor their political opinions on social media. This has been confirmed in an offline context by Lasorsa (1991), who found that self-reported political interest had a positive correlation with political outspokenness. In other words, people who are more interested in politics are less likely to self-censor, even in disagreeable opinion climates (Lasorsa, 1991).

H2a: Increased political interest will be negatively associated with self-censoring behaviour.

As far as we know, placement on the political spectrum has not yet been investigated in relation to the spiral of silence or self-censoring behaviour. We are interested in this relationship because it may help us to understand the nature of self-censorship in the current political climate and in the context of political polarization research. We know that political certainty and strongly-held views predict speaking out, while uncertainty predicts self-censorship (Matthes et al., 2010). If there is a positive relationship with identifying with the political periphery (i.e. far-left or far-right politics) and having strongly-held views, it may be that people on the far-left and far-right will be less likely to self-censor. We recognize that this relationship will likely differ based on the political and cultural contexts in the countries included in this study. For example, if the political climate in a country is shifting towards the right, and a person identifies with far-left politics, they may be more likely to experience disagreeable views, and subsequently be more likely to self-censor.

H2b: Where an individual is on the political spectrum will be related to self-censorship behaviour.

Strategic Uses of Social Media

Social media can be used in numerous ways and for many purposes, for instance, as a source for political information, and as a way to learn about the political opinions of others (Duggan & Smith, 2016). Spiral of silence research has examined individual level variables such as disposition (Matthes et al., 2012), issue importance, and fear of isolation (Wilnat & Lee, 2002). Hampton et al.'s (2014) study on the spiral of silence and social media found that people were less likely to discuss controversial topics online than in person. However, very little is known about how the specific ways that people choose to use social media impacts self-censorship. Since the use of social media is not specifically directed at political communication (Dutton et al., 2013; Pew Research Center, 2018), we do not anticipate that frequency of use has a direct relationship to self-censoring behaviour. However, we expect certain uses of social media to be associated with opinion expression online (Kwon et al., 2015).

We suggest social media provide users with a myriad of ways to communicate about politics and the choices individuals make about their social media use are meaningful. This approach considers the agency of users to decide how to use social media, and for what purposes. Therefore, we question to what degree the spiral of silence applies to those who explicitly use social media for political communication, and those who do not. We consider whether people who use social media for political purposes will be more or less likely to self-censor. By including these behavioural variables, we aim to consider the respondent's agency, and the active decisions that shape their experience of social media. Spiral of silence research has largely focused on the study of media 'effects'. While these contributions provide important insight into how social media impacts political communication, they may ignore the ways that individuals strategically make use of social media for political discussion.

We differentiate between two possible ways people use social media for political purposes: use of social media to learn about the political opinions of others and use of social media to keep up with politics¹. We see these as related, but distinct uses of social media. First, the question of how important social media are for learning about the political views of other people is directly related to the existence of a spiral of silence on social media. Noelle-Neumann's (1974) theory states that people decide to self-censor based on how they observe the opinions of people around them. There are many ways to gather information to tell us what the opinion climate is, including face-to-face conversations, the mass media, and now, social media (Hampton et al., 2014). We expect that people who are increasingly attuned to the opinion climate on social media, evidenced by rating social media as being important for learning about other people's opinions, will be more susceptible to the spiral of silence. People who use social media to assess public opinion will be more likely to experience a spiral of silence on social media. However, the inverse could also be true. If people rate social media as being unimportant for learning about other opinions this could signal that they are not heavy political users of social media, and thus may be less likely to experience a spiral of silence online because they do not think of social media as a political space in the first place.

RQ1: How is the perceived importance of social media for learning about other people's opinions related to self-censoring?

Second, we are interested in whether people who use social media specifically for gathering political information will be more likely to self-censor. It is possible that using social media to seek out political information would decrease self-censoring, as there is an expectation that politically

¹ We use a variable related to how people seek out political information, rather than mere exposure to it. Past studies found that attention to political information in the news media affects the likelihood of people speaking out on political issues, but that mere exposure to political information does not (Lasorsa, 1991).

interested people, who experience the spiral of silence less (Lasorsa, 1991), will also be more likely to use social media for political purposes. However, the inverse is also possible. Social media users who accidentally come across political information may self-censor more because they choose *not* to use social media for political purposes, and therefore have little interest in engaging in political conversations. Notably, Choi and Becker (1987) found that people who frequently use news media are more certain in their political views, and were more likely to speak out, even in hostile environments. It is not mere exposure to news media that had this effect, rather people who were actively attentive to the news were more likely to feel comfortable being outspoken (Choi & Becker, 1987). Therefore, it is reasonable to expect that people who actively seek out political information on social media will be more certain in their political views, and thus less likely to self-censor:

RQ2: How is the use of social media for political purposes related to self-censoring?

Methods

Data

We use data collected by the Quello Search Project, a study on the role of online search and social media in shaping the influence of political information. The data was collected in January 2017 in France, Germany, the United Kingdom, and the United States. 8,000 cases were collected in a random sample of the online population in each country (n=2,000 in each country). Post-stratification weights are used to maintain the representation of age, gender, and region, according to the census. We use a subsample including only those individuals who report using at least one social media site resulting in the following totals per country: France, n=1756; Germany, n=1662; UK, n=1734; US, n=1831. The data collection was funded by Google, however, Google has had no access to this research prior to publication.

Variables and Measurement

We use hierarchical multiple regressions to analyze these data. As control variables, we include demographic variables: age, gender, level of education, work status, and income. We introduce two additional controls, a self-report skill of using the Internet, and the number of social media accounts respondents have.

First Set of Predictors - Hypothesis 1a and 1b

Opinion Climate – Agreement with Political Opinions of Friends on Social Media

The initial set of predictors in the multiple regression model measure the opinion climate that respondents perceive on social media. The degree to which respondents disagree with the political opinions of their friends on social media is measured by an item asking, ‘How often do you find that you disagree with the political opinions or political content your friends post on social media?’. Responses were measured on a 5-category Likert scale from ‘Nearly always’ to ‘Almost never’.

Turbulence of the Opinion Climate - Noticing Different Political Opinions on Social Media

Noticing that one’s friends have different political views from what respondents thought is measured using an item that asks, ‘How often, if ever, have you noticed that someone’s political beliefs were different than you thought they were, based on something they posted on social media?’. Respondents answered this question with frequencies ranging from ‘Often’ to ‘Never’. These variables are specific to the online opinion climate that respondents perceive.

Second Set of Predictors - Hypothesis 2a and 2b

Political Interest

We measure the impact that a person’s political interest has on their likelihood to self-censor on social media. Political interest was measured by a question asking, ‘How interested would you say

you are in politics?', with responses ranging on a 4-category Likert scale from 'Very interested' to 'Not at all interested'.

Placement on Political Spectrum

We measure the respondents' placement on the political spectrum using a self-report item that asks: 'Some people talk about 'left', 'right', and 'centre' to describe parties and politicians (Generally socialist parties would be considered 'left wing' while conservative parties would be considered 'right wing'). With this in mind, where would you place yourself on the following scale?'. The responses on the scale range from 'Very left-wing' to 'Very right-wing'.

Third Set of Predictors - Research Question 3a and 3b

Here we measure how social media use and online activity affects respondents' self-censoring behaviours. This part of the model is made up of two variables that describe the importance respondents place on social media for learning about the political opinions of others and keeping up with political news.

Social Media and Learning about Opinions of Others

The importance of social media for learning about others' opinions was measured by asking, 'How do you learn about what other people are thinking about political candidates or issues?'. Respondents rated different sources for learning about political issues, including an item titled, 'Discussion on social media like Facebook', which they rated on a 4-point scale ranging from 'Very informative' to 'Irrelevant'.

Social Media and Keeping Up with Politics

The importance of social media for keeping up with political issues is measured by asking, 'Overall, how important are social media to you when it comes to keeping up with political news, debates and discussions?'. Respondents rated the importance on a 4-point scale ranging from 'Very important' to 'Not at all important'.

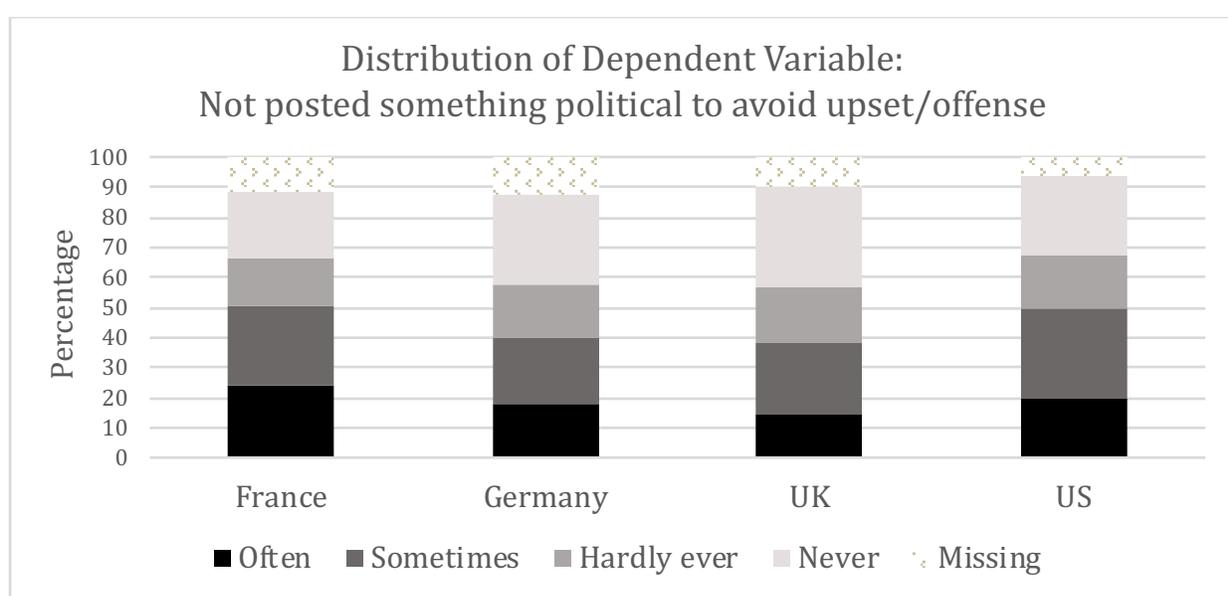
Dependent Variable

Self-censoring behavior on social media

Online self-censoring behaviour is conceptualized as people deciding not to post political opinions on social media due to concerns of upsetting or offending others. This behaviour is measured by the question, "Some people may decide not to post a political comment or link on social media because they are worried about upsetting or offending another person. How often do you not post something due to this concern?". Response options are: often, sometimes, hardly ever, never, and don't know. "Don't know" is treated as missing along with those who refused to answer this question.

Results

Figure 1 – Distribution of the dependent variable



Our dependent variable is distributed similarly in all four countries (see Figure 1) with responses spread across all response categories. Between 23% and 33% of social media users in each country never self-censor. Survey respondents in France and the US have slightly higher rates of “sometimes” or “often” self-censoring. It should be kept in mind that missing data accounts for between 6% and 12% of the social media using population. This is primarily due to the “don’t know” response option.

We conducted a multiple hierarchical regression analysis which consisted of a base model with only our control variables and three subsequent models which systematically introduced new independent variables so that we could test the added value of each set of independent variables for explaining variance in the dependent variable. All models are significant and no excessive multicollinearity is detected. The following section presents tables for each model with the standardized regression coefficients for each country.

Table 1 – Controls

	France	Germany	UK	US
Age	-0.065	-0.073	-0.204***	-0.126***
Female	0.017	0.031	0.029	0.075**
Education level	-0.026	-0.034	0.056*	0.0
Student	-0.009	-0.031	-0.02	0.014
Employed	0.061	0.023	0.06	0.057
Retired	0.142**	0.039	0.071	-0.002
Income	0.051	0.005	-0.034	0.066*
Skills	0.024	0.065*	0.014	-0.017
Number of social media	0.102**	0.119***	0.221***	0.214***
N	1208	1260	1318	1565
Adjusted R ²	0.012	0.025	0.123	0.105

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; OLS regressions presenting standardized beta coefficients; Omitted categories are male and unemployed.

As Table 1 shows, the number of social media an individual uses is the only variable which is a significant positive predictor of self-censorship across all four countries. The more social media accounts an individual has, the more likely they are to have self-censored. In the UK and US age is negatively related to self-censorship indicating older people are less likely to self-censor. Gender, education, employment status, income and skill are all occasionally significantly and positively related to self-censorship, though these relationships are relatively weak, and they are not consistent across countries.

Table 2 - Opinion Climate and Self-censoring

	France	Germany	UK	US
Age	-0.037	-0.006	-0.102**	-0.078**
Female	0.02	0.05	0.038	0.063**
Education level	-0.036	-0.032	0.039	-0.003
Student	-0.006	-0.015	-0.014	0.025
Employed	0.03	0.0	0.029	0.038
Retired	0.087	0.0	0.063	-0.016
Income	0.058*	0.002	-0.021	0.053*
Skills	0.008	0.04	-0.009	-0.022
Number of social media	-0.016	0.044	0.102***	0.135***
Disagree on social media	0.137***	0.142***	0.082**	0.081***
Notice different opinion on social media	0.375***	0.334***	0.427***	0.329***
N	1208	1260	1318	1565
Adjusted R ²	0.188	0.168	0.297	0.223
Adjusted R ² Change	0.176	0.143	0.174	0.118

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; OLS regressions presenting standardized beta coefficients; Omitted categories are male and unemployed.

Our first set of independent variables are related to political opinion climate. As Table 2 shows both disagreeing with others on social media and noticing that friends' opinions are different from expected are positively related to self-censorship in all four countries. When the political opinion climate is perceived to be disagreeable people tend to self-censor more. This **supports** H1a and the Spiral of Silence theory broadly. Noticing unexpected political opinions on social media is also positively related to self-censorship, **supporting** H1b.

In the UK and US number of social media remains significant and positive while age remains significant and negative. Gender and income are sometimes significant and positive while other previously significant variables are now insignificant.

Table 3 - Political Interest and Placement on Political Spectrum

	France	Germany	UK	US
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Age	-0.049	-0.02	-0.124***	-0.1**
Female	0.026	0.058*	0.048*	0.078***
Education level	-0.039	-0.035	0.033	-0.011
Student	-0.007	-0.021	-0.016	0.02
Employed	0.03	-0.007	0.026	0.039
Retired	0.085	-0.007	0.06	-0.017
Income	0.049	-0.003	-0.029	0.046
Skills	0.004	0.034	-0.012	-0.031
Number of social media	-0.017	0.042	0.097***	0.123***
Disagree on social media	0.138***	0.139***	0.072**	0.077***
Notice different opinion on social media	0.364***	0.327***	0.411***	0.307***
Political interest	0.05	0.047	0.079**	0.092***
Political spectrum	-0.039	-0.012	-0.008	0.008
N	1208	1260	1318	1565
Adjusted R ²	0.19	0.168	0.301	0.229
Adjusted R ² Change	0.002	0.0	0.004	0.006

Notes: * p<0.05, ** p<0.01, *** p<0.001; OLS regressions presenting standardized beta coefficients; Omitted categories are male and unemployed.

Our second set of independent variables consider an individual's political preference in terms of self-reported interest in politics and placement on the political spectrum. As table 3 shows, in the UK and US political interest is significantly positively related to self-censorship while in France and Germany it is not significant. This is surprising because we expect people who are more interested in politics to self-censor less. Political spectrum is not significant in any country. Thus, both H2a and H2b are **rejected**.

Notably, political climate variables remain significant predictors in all countries. The UK and US remain different from France and Germany in terms of age and number of social media. Gender becomes significant and positive in Germany, the UK, and the US.

Table 4 – Political Opinion and Information Gathering on Social Media

	France	Germany	UK	US
Age	-0.04	-0.001	-0.085**	-0.072*
Female	0.026	0.047	0.047*	0.075***
Education level	-0.036	-0.029	0.041	-0.002
Student	-0.009	-0.017	-0.016	0.029
Employed	0.029	-0.001	0.022	0.038
Retired	0.083	0.0	0.053	-0.012
Income	0.05	0.014	-0.029	0.051
Skills	0.002	0.027	-0.027	-0.029
Number of social media	-0.032	0.008	0.066*	0.086**

Disagree on social media	0.131***	0.129***	0.061*	0.072**
Notice different opinion on social media	0.354***	0.283***	0.363***	0.28***
Political interest	0.042	0.015	0.047	0.053*
Political spectrum	-0.041	-0.007	-0.025	-0.004
Learn about others' opinions on social media	-0.016	0.022	0.042	0.065*
Importance of social media	0.073*	0.149***	0.155***	0.105***
N	1208	1260	1318	1565
Adjusted R ²	0.192	0.186	0.321	0.243
Adjusted R ² Change	0.002	0.018	0.02	0.014
Adjusted R ² Change from controls only model	0.18	0.161	0.198	0.138

Notes: * p<0.05, ** p<0.01, *** p<0.001; OLS regressions presenting standardized beta coefficients; Omitted categories are male and unemployed.

Our final set of independent variables consider how individuals choose to use social media. For their political communication. As Table 4 shows, whether social media helps people learn about the opinions of others is positive and significant in only the US. In contrast, the perceived importance of social media for politics is a significant and positive predictor of self-censorship across all four countries. In response to RQ1, only in the US is use of social media to learn about others opinions significantly related to self-censorship. Americans who choose to use social media in this way self-censor more. In response to RQ2, across all four countries use of social media for political purposes is positively related to self-censorship. Those who choose to use social media for political purposes are more likely to self-censor.

Political climate variables remain significant and positive across all four countries and number of social media remains significant and positive and age remains significant and negative in the UK and US. Gender is now significant and positive only in the UK and US. Political interest is now significant only in the US.

The overall change in Adjusted R2 from the base model to our final model including all independent variables range from 13.8 to 19.8 percentage points. This is a substantial change which indicates that our independent variables are helping to explain variance in self-censorship above and beyond basic control variables.

In sum, political opinion climate is indeed an important predictor of self-censorship. This is in line with past work on the spiral of silence. The choices of individuals as they use social media also appear relevant across all four countries. This is a novel finding and points to important avenues for future research. Finally, there appears to be differences across two groups: France and Germany; and the UK and the US. This merits further investigation and points to the clear need for further cross-national research as well as contextual development of both theory and policy.

Discussion

Our findings consistently show support for the spiral of silence theory on social media across France, Germany, the UK, and the US. We find support for our first set of hypotheses, *H1a: Users who perceive a disagreeable opinion climate, evidenced by their belief that they do not hold similar political views with their online contacts, will be more likely to self-censor.* And *H1b: Users who notice,*

based on something posted on social media, that their friends have different political views than what they expected will be more likely to self-censor. People do self-censor when they believe their view is counter to the majority view. This is true both in terms of whether a person generally reports disagreeing with those they encounter on social media and whether a person has ever learned a friend's opinion is different than they expected on social media.

We then extend past work on the spiral of silence by considering individuals' political interest and placement on the political spectrum. We hypothesize that, *H2a: Increased political interest will be negatively associated with self-censoring behaviour.* And, *H2b: Where an individual is on the political spectrum will be related to self-censorship behaviour.* In both cases we reject our hypothesis, political interest and placement on the political spectrum are not significant predictors of self-censorship on social media. Notably, political interest is a significant predictor of increased self-censorship in the US and sometimes the UK which is counter to our expectations.

Finally, we ask whether an individuals' choices about how they use social media influences their self-censoring behaviour. We ask, *RQ1: How is the perceived importance of social media for learning about other people's opinions related to self-censoring?* We find that those who believe social media is important for learning about others' political views are more likely to self-censor only in the US. We also ask, *RQ2: How is the use of social media for political purposes related to self-censoring?* We find that across all four countries there is a significant and positive relationship between political use of social media and self-censoring.

This study advances our understanding of the contexts in which individuals choose to self-censor in two key ways. First, we consider individual agency in terms of political preferences and social media use. Second, we offer cross-national comparison which is rare in the literature.

The Spiral of Silence and Self-Censorship in a High Choice Media Environment

While the spiral of silence theory is supported by our findings we also suggest that other variables should be considered when evaluating motivations for self-censorship on social media. A high-choice media environment affords individuals substantial agency in determining what information they will consume and how. The high choice media environment provides people with numerous sources for political information, and many new forums for discussion, meaning that considering the choices people make is more important than ever (Aelst et al., 2017).

When using social media individuals have new access to information about the opinions of others which may impact the dynamics of the spiral of silence (Hampton et al., 2014). The spiral of silence theory assumes individuals use a "quasi-statistical sense" to judge the opinion climate (Hayes et al., 2011). Typically spiral of silence research examines the relationship between perceiving a disagreeable climate and self-censorship, but early work on the theory also noted that an uncertain opinion climate is also likely to increase self-censorship (Noelle-Neuman, 1984). We test both hypotheses and, across all four countries, we find that frequency of noticing, on social media, that someone's opinion are different than you previously thought is the strongest predictor of increased self-censorship on social media across all of our models. Perceiving an uncertain opinion climate on social media may be such a strong and consistent predictor of self-censoring because of the diverse ways individuals tend to use different social media sites. Individuals tend to present themselves in different ways in different online contexts (Liu et al., 2017; Marwick & boyd, 2010) and political users of social media are often strategic in their decisions about what content to post where (Dubois 2015).

Notably, our measure of uncertainty of the political climate is narrow and therefore limited. We conceptualized uncertainty specifically in terms of learning new information, on social media, about friends' opinions. However, the climate can feel uncertain even if one does not discover their friends have different opinions than previously assumed. It is also possible to notice these differences and not necessarily interpret them as a sign of an uncertain climate, for example, if you notice a friend's opinion is different but you do not value their opinion as an indicator of the wider

climate. Nevertheless, we believe ours is a useful measure because it asks individuals to remember a specific kind of uncertainty which occurs specifically within social media platforms. Further, our question is specific and tangible which helps minimize memory bias (Bradburn et al., 1987). The strength and significance of this narrow measure suggests future investigation of uncertainty in the political climate as it relates to self-censorship could be fruitful.

It is then particularly interesting that individual's perception of how informative social media is for learning what other people think about politics is not significant. This could be explained by the fact that there are a variety of other ways that individuals learn about the political opinions of others in a high-choice environment (Dutton et al., 2017). Some of these other ways, such as talking with friends and family offline, may be the main or only way someone who is likely to self-censor chooses to learn about political opinions of others. Even for those who do rely on information about other people's opinions gleaned from social media, it is highly unlikely they do so in a vacuum - other forms of communication matter too. It is also important to remember that an individual's perceived importance of social media for keeping up with politics is positive and significant. This underscores the value of considering how an individual chooses to use different media. While a detailed investigation into all the ways an individual can learn about politics generally or others' opinions specifically is beyond the scope of this paper, this is an important next step for researchers to understand self-censorship in a high-choice media environment.

The Spiral of Silence and Political polarization

We began this article by suggesting the increased opportunity to share political opinions and to learn about the political opinions of others on social media suggest that the spiral of silence theory may be amplified in a high-choice media environment. Support for the spiral of silence theory, in a mass media environment, can be thought of as leading to a homogenization of opinions shared publicly - the opposite of political polarization. Self-censorship occurs at a micro-level and in a mass media environment, it is often assumed those micro acts together lead to a single dominant view point. Yet, studies of social media have also pointed to their value in creating niche communities, mobilizing specific groups (Howard & Parks, 2012; Tufekci & Wilson, 2012), and creating filter bubbles (Pariser, 2011) which may exacerbate political polarization and create heterogenous public opinions at a macro level. Observing heterogenous opinions and divisions at a macro level could lead people to believe the spiral of silence is no longer at play but our research shows differently. The perceived political climate does influence self-censoring behaviour.

Consider a spiral of silence effect within an existing online community. In niche communities the spiral of silence could convince people that a specific view is common broadly, even though it is only popular within that specific group. Political polarization could in fact be amplified within groups which choose to use their social media in ways that insulate them from alternative ideas.

Notably, our analysis considers social media generally and does not address specific niche communities. This is both a strategic and practical choice. While people can engage in niche communities, most people do in fact choose to use a variety of media to learn about politics (Newman et al., 2018). Practically, it is very difficult to identify specific niche communities online and then access a sample of individuals which is representative of the larger population of a given nation or multiple nations as is our case. These case studies are very valuable for understanding the dynamics of particular communities but do not help us understand larger trends. Finally, elsewhere we have shown that, at least within this dataset (Blank & Dubois, Forthcoming; Dutton et al., 2017), the majority of individuals do in fact use social media in a way that helps them avoid echo chambers. This lightens worries about the larger impacts of this kind of singular platform polarization.

Further tempering fears about the spiral of silence amplifying political polarization is the fact that across all four countries we examined, where an individual falls on the political spectrum

is not a significant predictor of self-censorship. People are no more or less likely to self-censor regardless of whether they consider themselves far left, far right, or somewhere in between. Notably, we asked about ideology which means that the national contexts may have a substantial impact on how individuals interpreted this survey question and how we, as researchers, can interpret the results. For example, being far right or left in the US, a two-party system, likely means the individual is on the fringe and holds a minority view whereas in France, where coalition governments are more common, the same assumption should not be made.

Had we found the variable to be significant in any of the countries the specific national context would have been important in interpreting those results. It would also have been helpful to measure the intensity with which political views are held given that past spiral of silence work suggests those who hold their beliefs strongly are less likely to be influenced by social pressure to self-censor. Unfortunately, this data is not available.

The cross-national context

We selected four western democracies for our analysis to understand whether the spiral of silence theory and self-censorship differ across contexts while maintaining a base level of similarity in the political structure of each case. While our overarching findings tend to be consistent across all countries, we find two groups emerge: the two main-land European countries, France and Germany, tend to be similar to each other while the UK and the US tend to be similar to each other. For example, in most models age is a negative predictor of self-censorship in the UK and US but it is insignificant in France and Germany. Similarly, number of social media is positive and significant for the UK and US in all models, while not significant for France and Germany. Perhaps most interesting, political interest is positive and significant in the US and sometimes the UK but not France and Germany. This suggests personal preferences and individual agency could have differing effects depending on national contexts. This finding warrants further investigation as factors such as political climate, media literacy and education, and culture, could impact how individuals use social media.

Broadly, these differences highlight the importance of conducting cross-national studies (Scheufele & Moy, 2000) and not relying solely on the abundance of studies conducted in the US, and to a lesser extent UK, context. When we rely on data from a single context we risk developing theory which is tailored to that specific context and which is not adequately tested outside of it. For example, with only the US data we might conclude that using social media to learn about the opinions of your friends is an important component of self-censorship broadly but our data from three other countries suggests this could actually be unique to the American context. Further, as policy is developed based on our findings, a lack of cross-national comparison could lead to ill-suited policy solutions.

Conclusion

Ultimately, we find support for the spiral of silence theory on social media across four countries: France, Germany, UK and US. We show that individual choices about how they use social media are important for our understanding of when people will choose to self-censor on social media. We also see evidence that the choices and preferences of individuals may have differing effects cross-nationally. When considering the relevance of media effects theories such as the spiral of silence we, as researchers, need to strive to consider the choices of individuals across national context. Not everyone chooses to make use of social media in the same way and in order to understand phenomenon such as political self-censorship we need to consider the agency of individuals.

Bibliography

- Aelst, P. Van et al. 2017. "Political communication in a high-choice media environment: a challenge for democracy?" *Annals of the International Communication Association* 41 (1): 3–27. doi: 10.1080/23808985.2017.1288551.
- Anduzia, E., M. J Jensen., and L. Jorba. eds. 2012. *Digital Media and Political Engagement Worldwide: A Comparative Study*. New York, NY: Cambridge University Press.
- Baldassare, M. and C. Katz. 1996. "Measures of Attitude Strength as Predictors of Willingness to Speak to the Media." *Journalism and Mass Communication Quarterly* 73 (1): pp. 147–58.
- Bimber, B. 2004. "The Internet and Political Fragmentation." Paper presented at the Democracy in the 21st Century Conference. Urbana-Champaign, IL.
- Blank, G. and E. Dubois. Forthcoming. "Are There Echo Chambers? A 7-nation Comparison." International Journal of Press/Politics Conference, Oxford, UK.
- Bradburn, N.M., L.J. Rips, and S.K. Shevell. 1987. "Answering Autobiographical Questions: The Impact of Memory and Inference on Surveys." *Science* 236 (157): 208-16
- Choi, H. C., and S.L. Becker. 1987. "Media Use, Issue/Image Discriminations, and Voting." *Communication Research* 14 (3): 267–90.
- Conover, M. D., J. Ratkiewicz, M. Francisco, B. Goncalves, A. Flammini, and F. Menczer. 2011. "Political Polarization on Twitter." Paper presented at the Fifth International AAAI Conference on Weblogs and Social Media, July 17-21, Barcelona, Spain.
- Dahlgren, P. 2002. "In Search of the Talkative Public: Media, Deliberative Democracy and Civic Culture." *Javnost* 9 (3): 5–26. <https://doi.org/10.1080/13183222.2002.11008804>
- Dahlgren, P. 2005. "The Internet, Public Spheres, and Political Communication: Dispersion and Deliberation." *Political Communication* 22 (2): 147–62. <https://doi.org/10.1080/10584600590933160>
- Delli Carpini, M. X., F.L. Cook, and L.R. Jacobs. 2004. "Public Deliberation, Discursive Participation, and Citizen Engagement: A Review of the Empirical Literature." *Annual Review of Political Science* 7: 315–44. <https://doi.org/10.1146/annurev.polisci.7.121003.091630>
- Dubois, E. 2015. *The Strategic Opinion Leader: Personal Influence and Political Networks in a Hybrid Media System*, Dissertation, DPhil in Information, Communication and the Social Sciences, University of Oxford.
- Dubois, E., and G. Blank. 2018. "The Echo Chamber is Overstated: The Moderating Effect of Political Interest and Diverse Media." *Information, Communication & Society* 21 (5): 729–45. <https://doi.org/10.1080/1369118X.2018.1428656>
- Duggan, M., and A. Smith. 2016. "The Political Environment on Social Media." Pew Research Center. Retrieved from www.pewresearch.org.
- Dutton, W.H., G. Blank, and D. Groselj. 2013. "Cultures of the Internet: The Internet in Britain: Oxford Internet Survey 2013." Oxford Internet Institute, University of Oxford.
- Dutton, W., B. Reisdorf, E. Dubois, and G. Blank. 2017. "Social Shaping of the Politics of Internet Search and Networking: Moving Beyond Filter Bubbles, Echo Chambers, and Fake News." Working Paper No. 2944191, Quello Center.

-
- Garramone, G. M. 1985. "Motivation and Selective Attention To Political Information Formats." *Journalism and Mass Communication Quarterly* 62 (1): 37–44. Retrieved from <http://journals.sagepub.com.proxy.bib.uottawa.ca/doi/pdf/10.1177/107769908506200106>
- Gearhart, S., and W. Zhang. 2014. "Gay Bullying and Online Opinion Expression: Testing Spiral of Silence in the Social Media Environment." *Social Science Computer Review* 32 (1): 18–36. <https://doi.org/10.1177/0894439313504261>
- Gearhart, S., and W. Zhang. 2015. "'Was It Something I Said?' 'No, It Was Something You Posted!' A Study of the Spiral of Silence Theory in Social Media Contexts." *Cyberpsychology, Behavior, and Social Networking* 18 (4): 208–13
- Gearhart, S., and W. Zhang. 2018. "Same Spiral, Different Day? Testing the Spiral of Silence Across Issue Types." *Communication Research* 45 (1): 34–54. <https://doi.org/10.1177/0093650215616456>
- Gil, H., N. Jung, and S. Valenzuela. 2012. "Social Media Use for News and Individuals' Social Capital, Civic Engagement and Political Participation." *Journal of Computer-Mediated Communication* 17: 319–36. <https://doi.org/10.1111/j.1083-6101.2012.01574.x>
- Glynn, C.J., A.F. Hayes, J. Shanahan. 1997. "Perceived Support for One's Opinions and Willingness to Speak Out: A Meta-Analysis of Survey Studies on the "Spiral of Silence."" *The Public Opinion Quarterly* 61 (3): 452–63.
- Graham, T., M. Broersma, K. Hazelhoff, and G. van't Haar. 2013. "Between Broadcasting Political Messages and Interacting with Voters: The Use of Twitter During the 2010 UK General Election Campaign." *Information, Communication & Society* 16 (5): 692–716.
- Gutmann, T., and D. Thompson. 1996. *Democracy and Disagreement*. Cambridge, MA: Harvard University Press.
- Habermas, J. 1989. *The Structural Transformation of the Public Sphere: An Inquiry Into a Category of Bourgeois Society*. Cambridge, MA: MIT Press.
- Hampton, K. N., L. Rainie, W. Lu, M. Dwyer, I. Shin, and K. Purcell. 2014. "Social Media and the "Spiral of Silence."" *Pewinternet.Org*, 4–5. Retrieved from <http://www.pewinternet.org/2014/08/26/social-media-and-the-spiral-of-silence/>
- Hampton, K. N., I. Shin, and W. Lu. 2017. "Social Media and Political Discussion: When Online Presence Silences Offline Conversation." *Information Communication and Society* 20 (7): 1090–107. <https://doi.org/10.1080/1369118X.2016.1218526>
- Hayes, A. F., C.J. Glynn, and J. Shanahan. 2005a. "Willingness to Self-Censor: A Construct and Measurement Tool for Public Opinion Research." *International Journal of Public Opinion Research* 17 (3): 298–323.
- Hayes, A. F., C.J. Glynn, and J. Shanahan. 2005b. "Validating the Willingness to Self-Censor Scale: Individual Differences in the Effect of the Climate of Opinion on Opinion Expression." *International Journal of Public Opinion Research* 17 (4): 443–55.
- Hayes, A. F., J. Matthes, and W.P. Eveland Jr. 2011. "Stimulating the Quasi-statistical Organ: Fear of Social Isolation Motivates the Quest for Knowledge of the Opinion Climate." *Communication Research* 40 (4): 439–62. <https://doi.org/10.1177/0093650211428608>

-
- Howard, P.N., and M.R. Parks. 2012. "Social Media and Political Change: Capacity, Constraint, and Consequence." *Journal of Communication* 62 (2): 359–62. <https://doi.org/10.1111/j.1460-2466.2012.01626.x>
- Iyengar, S., and K.S. Hahn. 2009. "Red Media, Blue Media: Evidence of Ideological Selectivity in Media Use." *Journal of Communication* 59 (1): 19–39.
- Kim, Y. 2011. "The Contribution of Social Network Sites to Exposure to Political Difference: The Relationships Among SNSs, Online Political Messaging, and Exposure to Cross-cutting Perspectives." *Computers in Human Behavior* 27: 971–7. <https://doi.org/10.1016/j.chb.2010.12.001>
- Kwon, K.H., S. Moon, and M.A. Stefanone. 2015. "Unspeakable on Facebook? Testing Network Effects on Self-censorship of Political Expressions in Social Network Sites." *Qual Quant* 49: 1417–35. <https://doi.org/10.1007/s11135-014-0078-8>
- Lasorsa, D. L. 1991. "Political Outspokenness: Factors Working Against the Spiral of Silence." *Journalism Quarterly* 68 (1): 131–40.
- Lee, J. K., J. Choi, C. Kim, and Y. Kim. 2014. "Social Media, Network Heterogeneity, and Opinion Polarization." *Journal of Communication* 64: 702–22. <https://doi.org/10.1111/jcom.12077>
- Liu, Y., J. R. Rui, and X. Cui. 2017. "Are People Willing to Share Their Political Opinions on Facebook? Exploring Roles of Self-presentational Concern in Spiral of Silence." *Computers in Human Behavior* 76: 294–302. <https://doi.org/10.1016/j.chb.2017.07.029>
- Lu, Y., K.A. Heatherly, and J.K. Lee. 2016. "Cross-cutting Exposure on Social Networking Sites: The Effects of SNS Discussion Disagreement on Political Participation." *Computers in Human Behavior* 59: 74–81. <https://doi.org/10.1016/j.chb.2016.01.030>
- Malaspina, C. 2014. "The Spiral of Silence and Social Media: analysing Noelle-Neumann's phenomenon application on the Web during the Italian Political Elections of 2013." Working Paper, London School of Economics.
- Martin, G., and A. Yurukoglu. 2014. "Bias in Cable News: Persuasion and Polarization." *American Economic Review* 107 (9): 2565–99
- Marwick, A. and d. boyd. 2010. "'I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience.'" *New Media & Society* 13 (1): 114–33. doi: 10.1177/1461444810365313.
- Matthes, J., et al. 2012. "Exemplifying a Dispositional Approach to Cross-Cultural Spiral of Silence Research: Fear of Social Isolation and the Inclination to Self-Censor." *International Journal of Public Opinion Research* 24 (3): 287–305
- Matthes, J., K.R. Morrison, and C. Schemer. 2010. "A Spiral of Silence for Some: Attitude Certainty and the Expression of Political Minority Opinions." *Communication Research* 37 (6): 774–800. <https://doi.org/10.1177/0093650210362685>
- McDevitt, M., S. Kioussis, S., and K. Wahl-Jorgensen. 2003. "Spiral of Moderation: Opinion Expression in Computer-Mediated Discussion." *International Journal of Public Opinion Research* 15 (4): 454–70.
- Mutz, D. C. 2002. "The Consequences of Cross-Cutting Networks for Political Participation." *American Journal of Political Science* 46 (4): 838–55. <https://doi.org/10.2307/3088437>

-
- Neubaum, G., & Krämer, N. C. (2018). "What Do We Fear? Expected Sanctions for Expressing Minority Opinions in Offline and Online Communication." *Communication Research*, 45 (2): 139–64. <https://doi.org/10.1177/0093650215623837>
- Newman, N., R. Fletcher, A. Kalogeropoulos, D. Levy, and R.K. Nielsen. 2018. "Reuters Institute Digital News Report 2018". Reuters Institute. University of Oxford.
- Noelle-Neumann, E. (1974). "The Spiral of Silence A Theory of Public Opinion." *Journal of Communication* 24 (2): 43–51. <https://doi.org/10.1111/j.1460-2466.1974.tb00367.x>
- Noelle-Neumann, E. 1977. "Turbulences in the Climate of Opinion: Methodological Applications of the Spiral of Silence Theory." *Public Opinion Quarterly* 41 (2): 143–58.
- Noelle-Neumann, E. 1984. *The Spiral of Silence: Public Opinion-Our Social Skin*. Chicago: University of Chicago Press.
- Pang, N., et al. 2016. "Can Spiral of Silence and Civility Predict Click Speech on Facebook?" *Computers in Human Behavior* 64: 898–905. <https://doi.org/10.1016/j.chb.2016.07.066>
- Papacharissi, Z. 2002. "The Virtual Sphere: The Internet as a Public Sphere." *New Media & Society* 4 (1): 9–27. <https://doi.org/10.1177/14614440222226244>
- Pariser, E. 2011. "Filter Bubble: What the Internet is Hiding from You." New York: The Penguin Press.
- Pew Research Center. 2018. "Social Media Use in 2018". Pew Research.
- Scheufele, D. A., and P. Moy. 2000. "Twenty-Five Years of the Spiral of Silence: A Conceptual Review and Empirical Outlook." *International Journal of Public Opinion Research* 12 (1): 3–28.
- Schulz, A., and P. Roessler. 2012. "The Spiral of Silence and the Internet: Selection of Online Content and the Perception of the Public Opinion Climate in Computer-Mediated Communication Environments." *International Journal of Public Opinion Research* 24 (3): 346–67 <https://doi.org/10.1093/ijpor/eds022>
- Stroud, N. J. 2008. "Media Use and Political Predispositions: Revisiting the Concept of Selective Exposure." *Political Behaviour* 30 (3): 341–66.
- Stroud, N. J. 2010. "Polarization and Partisan Selective Exposure." *Journal of Communication* 60 (3): 556–76.
- Sunstein, C. 2017. *Republic.com 2.0*. Princeton, NJ: Princeton University Press.
- Taylor, D. G. 1982. "Pluralistic Ignorance and the Spiral of Silence: A Formal Analysis." *Public Opinion Quarterly* 46 (3): 311–35.
- Tufeki, Z., and C. Wilson. 2012. "Social Media and the Decision to Participate in Political Protest: Observations From Tahrir Square." *Journal of Communication* 62 (2): 363–79. <https://doi.org/10.1111/j.1460-2466.2012.01629.x>
- Wilhelm, A. G. 1998. "Virtual Sounding Boards: How Deliberative is Online Political Discussion?" *Information, Communication & Society* 1 (3): 313–38. DOI: 10.1080/13691189809358972
- Willnat, L., W. Lee, and B.H. Detenber. 2002. "Individual-level Predictors of Public Outspokenness: A Test of the Spiral of Silence Theory in Singapore." *International Journal of Public Opinion Research* 14 (4): 391–412.