Polls Versus Commenters: Effects of Cross-Cutting Opinion Climates on Cross-Platform Opinion Expression

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Few spiral of silence studies have explored the influence of cross-cutting, multiple opinion climates on opinion expression outcomes across different online platforms. A 2 × 2 online experiment, accounting for individual issue-based and culturally influenced dispositions, reveals a main effect of individuals' perceived opinion congruity with forum commenters but not with public opinion polls on opinion expression. An interaction effect shows that individuals are more likely to post comments when they perceive opinion congruity with forum commenters and when they perceive incongruity with public poll results, with a greater overall likelihood to comment on social media (Facebook) than on website forums. Significant relationships are also found between the likelihood of expressing one's opinion and personal issue involvement, fear of authority, and fear of breaking the law online. Implications of the findings for the theoretical scope of an online spiral of silence in multiple opinion climates and cross-platform opinion expression are discussed.

Keywords: spiral of silence, opinion climate, public opinion poll, social media, forum comments, opinion expression

Issue discussions in online settings tend to spiral toward a dominant opinion, where the more visible opinions are amplified, minority opinions are silenced, and disagreeable ideas are marginalized (Schkade, Sunstein, & Hastie, 2007). These conditions lead to polarized spheres of public opinion akin to ideologically homogenous echo chambers (Pariser, 2011; Sunstein, 2009), where the perceived dominant opinion on issues might stem from a sense of false group consensus (Wojcieszak, 2008). Such faulty perceptions of online opinion climates, to some extent, explain the public disbelief of human voting behaviors that were in stark contrast to public opinion poll results during the 2016 Brexit referendum in the United Kingdom and in the 2016 presidential election in the United States, for example (Wright & Wright, 2018).

The spiral of silence (Noelle-Neumann, 1974) provides a robust explanation for such situations. The fear of social ostracism compels individuals to not express their thoughts publicly on contentious issues when their opinions are perceived to diverge from the dominant opinion. The spiral of silence thus occurs when individuals depend on their perception of the majority opinion (i.e., opinion climate)

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on issues that are being discussed (perceptual hypothesis) to evaluate how their own position on the issue relates to that of the majority (Glynn, Hayes, & Shanahan, 1997). This innate quasi-statistical process of sensing one's own opinion and that of the majority is, however, not straightforward due to the nonmonolithic and nonlinear nature of opinion climates (Jeffres, Neuendorf, & Atkin, 1999)— especially in online environments, where no single consonant opinion exists on any issue (Schulz & Roessler, 2012).

The present study proposes that such complexity is exacerbated in online settings, where incidental exposure to a multitude of opinion climates on an issue (Tewksbury, Weaver, & Maddex, 2001) requires individuals to simultaneously assess multiple and, often, cross-cutting opinion climates in relation to their personal opinions. In political communication, cross-cutting pressures arise from one's exposure to conflicting political viewpoints and are widely found to affect political participation (Goldman & Mutz, 2011; Mutz, 2002). Moreover, the amalgamation of mass media and interpersonal sources of public opinion indicators (i.e., mass–interpersonal convergence) in online settings (Neubaum & Krämer, 2017) warrants a better understanding of individuals' mental distinction between different opinion climates to evaluate its impact on opinion expression. Unfortunately, little is known about opinion expression outcomes that result from individuals' perceptions of conflicting opinions between oneself and that of the majority when individuals are simultaneously exposed to different opinion climates in online settings—for example, when individuals' read mass media–based public opinion polls on a topic versus forum comments on the same topic, and they perceive their opinion on the issue to be congruent with the polls and incongruent with the forum commenters, or vice versa.

To complicate matters, the hyperlinked and networked online environment enables users to share news and information as well as express their opinions across different platforms with different groups of people. For instance, users can choose to express their thoughts on social issues they have read about on websites or blogs with their social media friends and groups by sharing the news and posting their comments in social media (Pang et al., 2016). Despite these affordances, online spiral of silence studies tend to investigate opinion expression outcomes on specific platforms such as chat groups (e.g., McDevitt, Kiousis, & Wahl-Jorgensen, 2003), discussion forums (e.g., Yun & Park, 2011), ideological and news websites (e.g., Nekmat & Gonzenbach, 2013; Soffer & Gordoni, 2017), online review systems (e.g., Askay, 2015), and social networking sites (e.g., Chun & Lee, 2017; Fox & Warber, 2015, Gearhart & Zhang, 2014; Luarn & Hsieh, 2014). Few studies consider how the spiral of silence might lead to varying opinion expression outcomes on the same issue across different online platforms.

This study expands the theoretical scope of online spiral of silence research by investigating how congruent and incongruent self-versus-majority opinion pressures from different opinion climate indicators (i.e., public opinion polls and forum comments) affect users' likelihood to comment on a sociopolitical issue across different platforms (website forums and social media, particularly Facebook). Factors such as individual issue-based predispositions (personal involvement, attitude certainty) and culturally situated predispositions (fear of authority, responsible speech online, fear of breaking the law online) are also analyzed to achieve a more accurate investigation of the topic.

Online Spiral of Silence in Multiple Opinion Climates

An initial online spiral of silence work on discussion forums by Yun and Park (2011) postulates the multilayered nature of opinion climates in online settings. An online climate is posited to provide a cumulative sense of public opinion on a specific issue spread across different online platforms (i.e., social networking sites, websites, blogs). A within-forum climate is where a majority opinion is observed from the immediate environment in which public discussions on a specific issue are taking place (e.g., forums, discussion threads). Nekmat and Gonzenbach (2013) compared a large opinion climate from different website sources (i.e., news and ideological groups) and an immediate opinion climate from forum comments. They found that individuals' perceived opinion incongruity with the immediate opinion climate but not the larger opinion climate affects their willingness to speak out on LGBT rights in the forum. Little is known about how a distant opinion climate indicator such as results from a mass media–based public poll interacts with a more immediate interpersonal and social-based opinion climate indicator (i.e., forum commenters) to affect the expression of one's opinion across different online platforms.

Public Opinion Polls in Mass Media

A key postulate of the spiral of silence is that mass media, particularly news media, constitute a major source of reference for the majority opinion on societal issues (Moy, Domke, & Stamm, 2001). The aggregated level of issue opinion distribution reported in public polls is a strong indicator of the power of an opinion climate from news media to predict individuals' personal opinion expression and action (Noelle-Neuman, 1993; Tsfati, Stroud, & Chotiner, 2013). Public poll results spur the spiral of silence when some readers adjust their attitudes about an issue to be in step with the majority sentiment and express their opinions in conformity (Mutz, 1994), and those who do not change their opinions lapse into silence. An experiment by Gearhart and Zhang (2014) compares public polls in national referendums and majority opinion from social references (e.g., friends and family). The researchers found that, regardless of the types of issues, perceived opinion congruence with national-level opinion climates (i.e., public opinion polls) "emboldens" (p. 33) individuals to publicly express opinions on social media more so than group-level references.

Online Forum Commenters

By overtly displaying other people's views, discussions on online platforms create the social climate of opinions surrounding an issue. In line with the spiral of silence, individuals who perceive that their own opinion is dissonant with the opinion expressed by the majority of others in a group will avoid online conversations with the group due to a hostile social effect (Schulz & Roessler, 2012). The extent of the hostility perceived depends on whether discussions involve one's outer circles (e.g., strangers or weak-tie contacts, such as those in general websites) or inner circles (e.g., personal networks on social media). Such perceived hostile social effects were confirmed in a content analysis of 11,589 postings on discussion forums in review websites (Askay, 2015). Referring to the opinion climates in the forums as the prevailing micro-opinions, users actively monitor the majority opinion surrounding a topic as well as the "climate of opinion about other individuals" (Askay, 2015, p. 1820) when deciding to express their personal opinions.

S. Kim, Kim, and Oh (2014), on the other hand, found no significant relationship between individuals' personal opinion expression and their perception of whether their opinions are congruent with the majority of "netizens (citizens on the internet)" (p. 716) inferred from general postings on Facebook, Twitter, and online chat forums. The conflicting findings suggest that opinion climates perceived in online discussion settings can exist at different levels. Effects on personal opinion expression are more pronounced at the micro or direct level (i.e., observable opinions seen in direct immediate forums; e.g., Askay, 2015, Yun & Park, 2011) than in a broader opinion climate perceived from Internet users in general (S. Kim et al., 2014) or website sources (Nekmat & Gonzenbach, 2013).

Public Opinion Polls Versus Forum Commenters

Research on how individuals react to consistent or conflicting opinion climates in both public opinion poll results and online forum comments simultaneously is, unfortunately, lacking. A study by M. Lee and Chun (2016) on individuals' willingness to express views about an organization in social media provides some insights. Based on social judgment theory, the study compares the valence of opinions in public surveys and forum comments. Overall, users were more willing to express their personal views when survey results were negative about the organization, and negative forum comments produced a stronger effect on users' willingness to express organizational dissatisfaction. Although the findings indicate that valences in the two opinion climates can affect opinion expression, how users are simultaneously impacted by two or more opinion climates that can be consistent or conflicting (i.e., cross-cutting) on a morally debatable sociopolitical issue has not been examined.

There are compelling reasons to expect social pressures from forum commenters (i.e., the hostile social effect) to exert a stronger influence on individuals' willingness to express personal opinions or further silence users who already perceive opinion incongruity with public opinion poll results. Moreover, compared with a broader, more distant, and indirect opinion climate derived from public opinion poll results, the more immediate opinion climate from forum commenters has a greater potential to directly affect individuals' perceived social repercussions of expressing opinions that deviate from the dominant opinion.

Opinion Expression in Website Forums and Social Media

Expressing one's position in online settings, particularly on controversial or morally loaded issues, is not straightforward. Users can easily hyperlink or share the news and information encountered in a typical website along with their own comments to their personal networks on social networking platforms (Nekmat, Gower, Zhou, & Metzger, 2019; Pang et al., 2016). Users also can choose to express their opinions where discussion on an issue is ongoing, such as in a website forum, as well as on their own social media platforms (e.g., Facebook, Twitter). Therefore, to obtain a more accurate picture of the spiral of silence in online settings, it is "not sufficient to look only at whether one expresses his or her opinion, but rather through which channel(s) one is willing to express the opinion" (Askay, 2015, p. 1825).

For the present study, it is expected that users who find their opinion on an issue to be incongruent with the majority opinion expressed in the forum where the news is obtained can be compelled to share the

news and express their opinions on other platforms instead, such as on their social media. Indeed, "channels and content, as well as associated interpersonal and group channels, can be actively selected by people who do not fully identify with values expressed in the mainstream media" (Slater, 2007, p. 297). Symptomatic of an opinion expression avoidance strategy, individuals avoid expressing their opinions in situations where opposing arguments are more clearly experienced (e.g., online forums where an issue is under discussion) and choose instead to express them in more controlled personal settings in a more personalized way (e.g., social networking sites; Hayes, 2007), where the likelihood of having a like-minded audience, such as on one's own Facebook page, makes the expression seem less confrontational.

Online spiral of silence studies on individuals' willingness to express personal opinions in unfamiliar social settings (e.g., Web-based forums) and familiar ones (e.g., social networking sites) are inconclusive. On the one hand, in contrast to anonymous forums, posting personal opinions on a controversial issue on social networking sites where one tends to know the people in the network can increase inhibition due to appearing socially unpopular or undesirable to others in the network, especially if the social networks comprise members of one's reference groups (Kennamer, 1990) and are people anchored to one's off-line relationships (Gearhart & Zhang, 2014).

On the other hand, being around familiar people and having an established self-identity on social media can make one more willing to express personal opinions on controversial issues, regardless of opinion positions and congruity (Luarn & Hsieh, 2014). Holding opinions that are congruent with the majority, feelings of perceived social support, and a sense of social control when communicating to familiar social networks increase the likelihood of opinion expression online (Chun & Lee, 2017) as well as off-line (Lin, Cao, & Zhang, 2017). Indeed, as revealed in a meta-analysis of 66 spiral of silence studies involving more than 27,000 participants, personal networks (e.g., family, friends) represent the most significant and consistent moderator of opinion expression in incongruent opinion climates (Matthes, Knoll, & Von Sikorski, 2017). Moreover, knowing that one is commenting to a curated network of friends on Facebook, for example, imbues the belief that the people in this network are "more likely to reflect one's opinion" (Fox & Warber, 2015, p. 84), making the individual more willing to express personal thoughts on specific issues. Based on this discussion, the following hypotheses are posited.

H1:   Individuals are more likely to comment on website forums (H1a) and on social media (H1b) when they perceive that their opinions are incongruent rather than congruent with public opinion polls.

H2:   Individuals are more likely to comment on website forums (H2a) and on social media (H2b) when they perceive that their opinions are congruent rather than incongruent with forum commenters.

H3:   The likelihood that individuals will comment on website forums (H3a) and on social media (H3b) when they perceive opinion congruity with public opinion polls will increase when they also perceive opinion congruity with forum commenters.

H4:   Overall, individuals are more likely to comment on social media than on website forums.

Individual Issue-Based and Culturally Influenced Predispositions

Testing the spiral of silence effects of people's perceptions of an opinion climate on their willingness to express their own opinion requires considering extenuating individual predispositions that might affect opinion expression on specific issues and in various contexts (Hayes & Matthes, 2017) regardless of the opinion climates surrounding the issue (Hayes, 2007). One such predisposition is individuals' personal issue involvement. As a reflection of "the extent to which they care about the issue" (Krosnick, Boninger, Chuang, Berent, & Carnot, 1993, p. 1132) and of the perceived importance of the issue to their lives, personal issue involvement makes people "more likely to act on the issue and communicate about it out of civic duty rather than fear" (Gearhart & Zhang, 2014, p. 20). Studies have shown that an individual's personal issue involvement directly predicts her or his willingness to speak out publicly on an issue when the person's opinion is in the minority (S. Kim, Han, Shanahan, & Berdayes, 2004; Moy et al., 2001); in hostile online discussion settings (Gearhart & Zhang, 2014); and in various cultural contexts, such as on the legalization of same-sex marriage in a conservative society like Singapore (Ho, Chen, & Sim, 2013).

Similarly, attitude certainty and the level of conviction people personally hold on certain issues— also referred to as attitude strength (Tormala & Petty, 2002)—can predict one's willingness to speak out regardless of what others might think. People who are confident their opinions are correct are more likely than people who are uncertain about their personal stance on the issue to publicly express their opinions on a controversial issue despite what others think (Glynn et al., 1997; Matthes, Morrison, & Schemer, 2010).

The extent of individuals' willingness to speak out can also depend on several cultural self-concepts. Of these, three culturally influenced predispositions that are relevant to the spiral of silence in online settings and the present study's context in Singapore are fear of authority, fear of breaking the law (online), and responsible speech (online). These factors are particularly relevant in Singapore's authoritarian society, where a top-down and highly regulated style of governance is widely documented. People in Singapore are more inclined to "assume that expressing certain views are undesirable" and refrain from speaking out against dominant societal opinion on sociopolitical issues, because they tend to perceive that controversial views that promote dissent "can lead to negative consequences like jeopardizing one's comfortable lifestyle and livelihood" (Willnat, Lee, & Detenber, 2002, p. 396) and might run afoul of laws that maintain social and multiracial harmony.

In addition to Singaporeans' fear of breaking the law for posting comments online that go against the grain of societal thought and harmony, their inclination to self-censor their speech online might stem from constant media reminders to be personally accountable for their online postings by practicing "responsible speech" (Mokhtar, 2014). As an opinion avoidance strategy, being responsible and accountable for one's opinions posted in online settings is akin to a willingness to self-censor (e.g., Hayes, 2007). While responsible speech presents behavior motivated by desired cultural values shared by the community, willingness to self-censor is more of an individualized concept that explains a person's tendency to withhold his or her true opinions in a hostile opinion climate (Hayes & Matthes, 2017).

Differentiating the three culturally situated factors, fear of authority represents individuals' tendency to be less outspoken on controversial sociopolitical issues because of the general fear of repercussions from ruling bodies (Willnat et al., 2002). The fear of breaking the law online indicates one's apprehension to post comments online due to the possibility of being penalized. Responsible speech online, on the other hand, refers to the level of importance one places on self-censorship in order to be responsible and personally accountable for one's online postings.

To more precisely investigate the effects of different opinion climates on cross-platform opinion expression online, individuals' predispositions toward an issue and their culturally influenced predispositions are statistically controlled in the analysis.

Method

A 2 × 2 (congruent vs. incongruent opinion poll results × congruent vs. incongruent forum commenters' opinions) stimuli-embedded online experiment was carried out with a total of 414 undergraduates at a large university in Singapore. Most participants (n = 321, 77.5%) reported using Facebook about once per day on average. Facebook use was measured on a 5-point scale, where 1 = *never*, 2 = *once a week or less*, 3 = *a few days a week*, 4 = *about once a day*, and 5 = *more than several times a day* (M = 4.12, SD = 0.98). No participants reported not using Facebook at all. All participants had accessed online news websites, and most (n = 227, 55.8%) reported that they visit online news websites a few days a week on average (M = 3.31, SD = 1.37).

Procedure

To assign participants into congruent and incongruent issue opinion positions with the two opinion climates, a pretest survey was administered to determine participants' stand on a contentious LGBT-related issue and homosexuality. Participants rated on a 7-point Likert-type scale ranging from 1 (*very little*) to 7 (*very much*) how much they: (1) accept homosexuals (lesbians, gays, bisexuals, transgender); (2) accept homosexual-based groups and organizations; (3) are open to having friends who are homosexuals; and (4) are open to having friends who are members of homosexual-based groups and organizations (Cronbach's α = .82, M = 5.89, SD = 1.89). Overall, 233 participants held supportive attitudes, and 145 reported nonsupportive attitudes toward LGBT. The supportive group's answers on the 7-point scale averaged 4 or higher for all four items (M = 6.07, SD = 0.92), while the nonsupportive group's answers averaged less than 4 for all items (M = 3.32, SD = 0.79; e.g., Nekmat & Gonzenbach, 2013). Participants who reported 4 for all four items and thus had an overall average of 4 were considered neutral. Participants whose average score was greater than 4 but who had ranked any of the items lower than 4 and those whose average score was lower than 4 but who had ranked any of the items greater than 4 were excluded from the experiment (n = 36).

The 378 participants with clearly supportive or nonsupportive attitudes toward LGBT groups were then randomly assigned to one of the eight stimuli that were created to correspond to the four self-versus-majority opinion congruity conditions. This was done to ensure that participants who held supportive and nonsupportive attitudes toward LGBT groups were represented in all four experimental

conditions. For example, an LGBT-supportive participant was randomly exposed to a stimulus showing public opinion poll results and forum comments indicating majority support for LGBT for the congruent poll and congruent forum comment opinion climates condition. For the same condition, a participant with a nonsupportive attitude toward LGBT groups was randomly exposed to a stimulus showing public opinion poll results and forum comments indicating minority support for LGBT. Figure 1 illustrates the participant distribution procedure and the sample size in each condition.
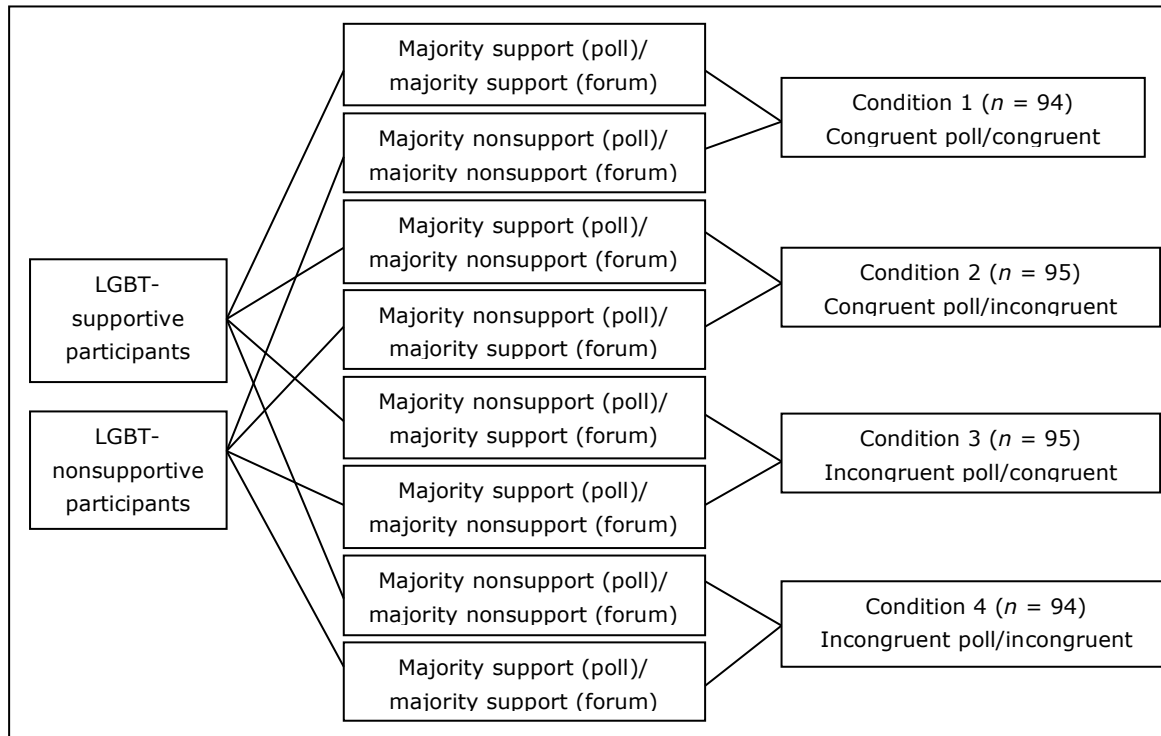
Figure 1. Distribution of participants to four experiment conditions via eight stimuli.

The stimulus that all participants were exposed to was a mock website belonging to a campus-based news organization. The fictional news report in the website was titled "LGBT-Based Student Group to Be Set Up on Campus" and reported on an "application from student bodies to set up an official LGBT-based student group" that aims to "encourage sexual minorities to embrace their identity more openly and foster greater integration with the campus community." The report ends by stating that "university administrators are still considering the proposal" and "are gathering feedback on the proposal." The LGBT-related issue is considered suitable in spiral of silence studies that require the use of a morally loaded and contentious issue (Scheufele & Moy, 2000). The pending nature of the decision (i.e., a proposal to action) adds to the deliberative potential of the issue among participants. Moreover, several studies have shown the suitability of the issue by using variations of the LGBT-related issue to examine the spiral of silence effect in a Singapore context (see, e.g., Ho et al., 2013; Lee, Detenber, Willnat, Aday, & Graf, 2004;

Willnat et al., 2002). The cultural proximity of the issue to the undergraduate sample population also increases the relevance and internal validity of the stimulus.

Distribution of Majority Opinion in Public Opinion Polls

Two levels of public opinion poll results produced in support of and opposition to LGBT groups and lifestyles were created by providing direct oppositional support words (*accepting*/*against*, *positive*/*negative*) with percentages of population unchanged. For example, "A nationwide survey showed that a majority of Singaporeans (65%) are [accepting of/against] gay lifestyles." To increase the believability of the poll's representation of public opinion on the issue, a separate public poll was provided in the same news report: "Singaporean views on gays and lesbians have become more [positive/negative] over the last five-year period. In 2016, 69.5 percent held [positive/negative] attitudes—up from 66.7 percent in 2011."

Distribution of Majority Opinion in Forum Commenters

Adapted from the modern homonegativity scale (e.g., Morrison & Morrison, 2002), two levels of opinion climates were manipulated by varying the distribution of LGBT-supportive and -oppositional comments among 10 forum participants by a ratio of 7 to 3, which approximately equates to the manipulated ratio distribution of public opinion poll results, 69.5% to 30.5%. Forum commenters were identifiable only by pseudonyms, which are typically afforded to users when posting messages in online forums. Oppositional LGBT statements were created using the same statements as LGBT-supportive statements, albeit with words that depict direct opposition. For example, "We [should/should not] welcome gays and lesbians as part of student community" and "Homosexuality is morally [acceptable/unacceptable] on campus."

Control and Manipulation Checks

Multiple checks were done to evaluate the validity of the experimental manipulation and the reliability of outcome measurements. First, participants rated, on a 7-point Likert-type scale ranging from 1 (*very little*) to 7 (*very much*) answers to the following two questions: "Overall, how similar are Singaporeans' public opinion toward LGBT as reported in the public opinion poll results in the news with yours?" and "Overall, how much do you share the forum commenters' opinions toward LGBT groups?" Independent-samples t test results reveal significant differences in participants' perceptions of opinion congruity ($M = 5.89$, $SD = 1.25$) and incongruity ($M = 2.35$, $SD = 1.67$) with the majority opinion displayed in polls, $t(296) = 14.43$, $p < .001$. Significant differences are also found for participants' perception of opinion congruity ($M = 6.03$, $SD = 1.33$) and incongruity ($M = 2.18$, $SD = 1.37$) with the majority opinion displayed in forums, $t(296) = 16.45$, $p < .001$.

Second, participants answered yes, no, or "not sure" to the question, "Do you think the public opinion poll results reported in the news article are accurate?" Chi-square test results reveal no significant differences between the four groups, $\chi^2(6) = 7.97$, $p = .76$, with participants largely believing that the poll results were either accurate (yes 81.8%) or "not sure" (11%). Responses from participants believing that the poll results were not accurate ($n = 24$) as well as incomplete survey responses ($n = 19$) were discarded.

Third, participants were asked to type their comments and click "post" after reading the stimulus. Responses from participants who had rated the likelihood of posting their comments as 5 (*somewhat likely*) to 7 (*definitely will*) but had not written their comments and posted them to either the forum or social media (*n* = 31) were omitted from the analysis. Similarly, responses from participants who had rated the likelihood of posting their comments as 1 (*definitely will not*) to 4 (*somewhat unlikely*) but had written comments and posted them were also removed (*n* = 6), leaving the total valid responses for analysis *N* = 298. Of these, 159 (53.4%) were female, with an overall mean and median age of 21.2 (*SD* = 1.31) and 21, respectively.

Measures

Likelihood to Post a Comment

The likelihood of posting a comment is operationalized as the likelihood that a participant will express her or his personal opinions on the issue and post them on the forum and on social media (Facebook). After exposure to the stimuli, participants answered on a 7-point Likert-type scale ranging from 1 (*definitely will not*) to 7 (*definitely will*) to two questions: (1) "How likely are you to post your own opinions on the issue in the forum?" (2) "How likely are you to share your own opinions on the issue in your own social media, particularly on Facebook?" (website forum *M* = 3.13, *SD* = 1.21; social media *M* = 3.76, *SD* = 1.59; *t*(297) = −2.79, *p* < .01).

Personal Issue Involvement

Also referred to as one's predisposition toward a certain cause or issue (Boyle et al., 2006), the personal issue involvement variable indicates how personally relevant and important a specific issue is to an individual (Y. Kim, 2009). On a 7-point Likert-type scale ranging from 1 (*very little*) to 7 (*very much*), participants reported their stance on the issue with four questions: (1) "How important are issues pertaining to LGBT and homosexuals to you personally?" (2) "How relevant are issues pertaining to LGBT and homosexuals to you personally?" (3) "How interested are you in issues pertaining to LGBT and homosexuals?" (4) "How affected are you toward the issue personally?" (Cronbach's α = .88, *M* = 4.98, *SD* = 1.22).

Issue Attitude Certainty

Issue attitude certainty is defined as the certainty and confidence that one's opinion on the issue is correct (e.g., Matthes et al., 2010). Participants answered two questions on a 7-point Likert-type scale ranging from 1 (*very little*) to 7 (*very much*): (1) "How certain are you about your opinion on homosexuality?" (2) "How confident are you that your opinion on homosexuality is right?" (*r* = .82, *p* < .001, *M* = 5.34, *SD* = 1.39).

Fear of Authority

The fear of authority variable represents individuals' tendency "to be less outspoken because of the general fear of the authorities" (Willnat et al., 2002, p. 400). Replicating the measurement developed by Willnat and associates, participants rated on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) their agreement with six statements: (1) "I feel that it is easy to get in trouble with authorities." (2) "People are often observed by the authorities." (3) "Authorities can negatively affect people's lives." (4) "I do not dare do anything that may incur punishment from authorities." (5) "Authorities will be able to find out if I do anything lawfully wrong." (6) "I would not do anything wrong even if I know that authorities do not know" (Cronbach's α = .84, *M* = 4.55, *SD* = 1.19).

Responsible Speech Online

The responsible speech online variable indicates the level of importance placed on being responsible and accountable for one's postings online. The relevant literature yields no specific measurements for this cultural-specific concept, so four items were created to measure the variable. Participants' rated on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) their responses to four statements: (1) "It is important for me to be held responsible for what I write online." (2) "It is important for others to be held responsible for what they write online." (3) "I should be held personally accountable for my own postings online." (4) "Everyone should be held personally accountable for their own postings online" (Cronbach's α = .87, *M* = 5.67, *SD* = .83).

Fear of Breaking the Law Online

Operationalized as one's apprehension to post comments online due to the possibility of breaking any laws, fear of breaking the law online was measured on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) indicating participants' agreement with three statements: (1) "It is scary to think about the possibility of breaking the law with my comment postings online." (2) "One of the worst things that could happen to me is to unknowingly break the law based on what I have posted online." (3) "I will post my comments online only if I am certain I am not breaking any laws with them" (Cronbach's α = .93, *M* = 4.77, *SD* = 1.39).

Results

Multivariate regression analysis for individual issue predispositions and culturally influenced predispositions reveal significant relationships between personal issue involvement and the likelihood of commenting on a website forum (β = .350, *p* < .01) and on social media (β = .380, *p* < .01), between fear of breaking the law online and commenting on website forums (β = −.34, *p* < .001) and social media (β = −.45, *p* < .001), and between fear of authority and commenting only on Facebook (β = .167, *p* < .05). Table 1 displays the results of all individual predispositions statistically controlled as covariates in the data analyses.

Hypothesis 1 posits that perceived opinion congruity with opinion polls leads to greater likelihood of commenting on website forums (H1a) and on social media (H1b), while H2 predicts that perceived

opinion congruity with forum commenters leads to greater likelihood to comment on website forums (H2a) and on social media (H2b). Results from a two-way multiple analysis of covariance (MANCOVA) with a Bonferroni pairwise groups comparison controlling for individual predispositions as covariates reveal no significant effect for public opinion poll results on the likelihood to post comments on a website forum ($M_{congruent}$ = 3.44, $M_{incongruent}$ = 3.14, p = .41; H1a) and on social media ($M_{congruent}$ = 3.73, $M_{incongruent}$ = 3.21, p = .32; H1b). Perceived opinion congruity with forum comments, on the other hand, leads to a greater likelihood to comment on a website forum ($M_{congruent}$ = 3.97, $M_{incongruent}$ = 2.81, p < .01), $F(8, 288)$ = 16.38, mean square = 32.22, p < .001, ηp^2 = .16 (H2a), and on social media ($M_{congruent}$ = 4.13, $M_{incongruent}$ = 2.92, p < .001), $F(8, 288)$ = 23.19, mean square = 46.77, p < .001, ηp^2 = .21 (H2b). Hypothesis 1 is thus not supported, and H2 is supported. The statistics output for the MANCOVA with individual predisposition covariates and pairwise opinion climate conditions on the likelihood to post comments on social media and website forums are provided in Tables 1 and 2, respectively.[1]

Table 1. Multiple Analysis of Covariance Results for the Likelihood to Comment on a Forum and on Facebook.

	Post comment on a forum				Post comment on Facebook			
	B	t	F	p	B	t	F	p
Public poll	0.051	0.471	0.776	.411	0.119	0.802	0.990	.323
Forum comment	1.55	6.29	33.3	.000	1.82	6.58	37.1	.000
Public poll × forum comment	−1.02	−3.01	9.08	.003	−1.42	−3.76	14.1	.000
Personal issue involvement	0.350	2.74	7.52	.006	0.380	2.66	7.09	.008
Attitude certainty	0.210	1.73	3.00	.084	−0.143	−1.13	1.27	.260
Fear of authority	0.066	0.861	0.740	.390	0.167	2.08	4.33	.038
Responsible speech online	−0.124	−1.06	1.12	.290	−0.138	−1.06	1.12	.291
Fear of breaking the law online	−0.341	−5.19	26.9	.000	−0.447	−6.08	36.9	.000

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[1] A two-way multiple analysis of variance with pairwise analysis of the four experimental groups was done to test the main and interaction effects without controlling for individual predispositions as covariates. No significant effect was found for public opinion poll results on the likelihood to post comments on website forums (B = 0.45, t = 1.81, p = .23) and on social media (B = 0.59, t = 2.02, p = .14). Perceived opinion congruity with forum comments produced a greater likelihood to comment on website forums (B = 1.75, t = 6.46, p < .001) and on social media (B = 2.11, t = 7.11, p <.001). The interaction effects on the likelihood to comment on website forums (B = −1.34, t = −3.77, p < .001) and on social media (B = −1.59, t = −4.34, p < .001) were more significant than the MANCOVA results with covariates. The overall significance on the likelihood to post a comment on a forum and on social media are: $F(3, 294)$ = 18.97, mean square = 60.00, p < .001, ηp^2 = .14 and $F(3, 294)$ = 19.91, mean square = 46.48, p < .001, ηp^2 = .17, respectively.

Table 2. Results of Pairwise Group Comparisons.

	Comparison group	Post comment Forum		Post comment Facebook	
		Mean difference	*p*	Mean difference	*p*
(A) Opinion poll congruent and	(B)	0.535	.138	0.396	.792
forum comment congruent	(C)	−0.902	.001	−1.20	.000
Post forum (*M* = 3.41)					
Post Facebook (*M* = 3.43)	(D)	0.649	.050	0.614	.153
(B) Opinion poll congruent and	(A)	−0.535	.138	−.396	.792
forum comment incongruent	(C)	−1.44	.000	−1.59	.000
Post forum (*M* = 2.88)					
Post Facebook (*M* = 3.04)	(D)	0.115	1.00	0.219	1.00
(C) Opinion poll incongruent and	(A)	0.902	.001	1.202	.000
forum comment congruent	(B)	1.44	.000	1.59	.000
Post forum (*M* = 4.31)					
Post Facebook (*M* = 4.63)	(D)	1.55	.000	1.82	.000
(D) Opinion poll incongruent and	(A)	−0.649	.050	−0.614	.153
forum comment incongruent	(B)	−0.115	1.00	−0.219	1.00
Post forum (*M* = 2.76)					
Post Facebook (*M* = 2.82)	(C)	−1.55	.000	−1.82	.000

Hypothesis 3 posits an interaction effect, such that the likelihood to comment on website forums (H3a) and on social media (H3b) when opinion congruity is perceived from poll results will increase when opinion congruity is also perceived from forum commenters. As observed from the two-way MANCOVA results shown in Table 1, significant interaction effects between both opinion climates were observed (website forum, $F(8, 288) = 12.62$, mean square = 18.71, $p < .01$, $\eta p^2 = .13$; social media, $F(8, 288) = 19.61$, mean square = 36.12, $p < .001$, $\eta p^2 = .18$). However, the likelihood to post comments on website forums and on social media increases when opinion incongruity is perceived with a public opinion poll and when opinion congruity is perceived with a majority of forum commenters (as shown in Figure 2, illustrating the plotted best-fit lines at subgroups of main factors). The interaction effect is thus significant but not in the direction posited in H3.
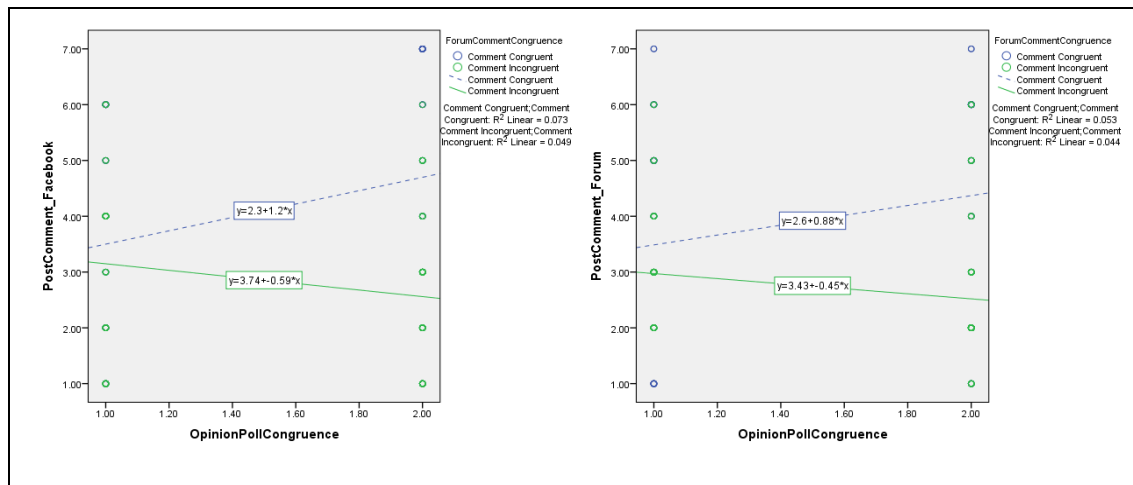
Figure 2. Likelihood to comment on forums (left) and Facebook (right) with opinion poll congruence (1.00 = congruent, 2.00 = incongruent) as a function of forum commenters' congruence.

Results of a paired-samples *t* test indicate that participants were more likely overall to comment on social media (*M* = 3.76, *SD* = 1.59) than on website forums (*M* = 3.13, *SD* = 1.21), *t*(297) = −2.79, *p* < .01. Participants were most likely to comment on social media (*M* = 4.13) when they perceive opinion congruity with forum commenters. Hypothesis 4, positing individuals' overall likelihood to comment more on social media than on website forums, is thus supported.

Discussion

This study expands the scope of online spiral of silence research by showing that, in multiple online opinion climate settings, individuals' perceived opinion congruity with a majority of forum commenters leads to a greater likelihood of opinion expression, but not for mass media–based public opinion poll results. This finding supports prior findings on the multilayered nature of opinion climates in online settings to predict opinion expression outcomes (e.g., Nekmat & Gonzenbach, 2013; Yun & Park, 2011), in that a more immediate level of opinion climate indicated by social commenters (i.e., overt opinions expressed by people via forum comments) can be more influential than a more distant opinion climate indicated by abstract and aggregated forms (i.e., numbers and percentages) in public opinion poll results.

While the finding might suggest that the traditional power of public opinion poll numbers reported in the news media to influence opinion expression on societal issues (Gearhart & Zhang, 2014; Gonzenbach, King, & Jablonski, 1999) succumbs to more immediate social pressures (i.e., forum commenters) in an online spiral of silence, it does not necessarily mean that poll results are not influential. As illustrated in Figure 2, the interaction between the two opinion climates reveals that incongruity between one's own opinion and that of the majority with poll results actually intensifies the likelihood of opinion expression. Notably, the finding provides evidence of cross-cutting opinion congruity

pressures that can arise from conflicting opinion climates—producing a greater likelihood of personal opinion expression when opinion congruity is perceived with the dominant opinion expressed by forum commenters and incongruity is perceived with public opinion polls.

A possible explanation for such cross-cutting opinion climate pressures is that users might feel compelled to engage in "corrective actions" when public poll results reported in the media are perceived to propagate public opinion that is contrary to their stand on an issue (Rojas, 2010). In this instance, alignment with the immediate opinion climate from forum commenters offers some level of social confirmation and facilitates personal opinion expression in a bid to reduce the dissonance between one's own opinion and that of the majority coming from a larger, more distant group represented in public opinion polls. Different layers of opinion climates, therefore, not only function as informational cues for opinion distribution but also exert different levels of interpersonal pressure for opinion expression. This interaction effect highlights a more complex quasi-statistical sensing process involving multiple, cross-cutting opinion climates that users sift through when deciding whether to express their opinions in online settings.

Tests of H4 indicate that, consistent across opinion climates, users prefer to share their opinions on social media than on website forums. Specifically, users would rather comment on Facebook than in a website forum even when opinion congruity is perceived with commenters in the forum. This confirms prior postulations and findings that individuals prefer to express their opinions in more familiar and personal settings (Hayes, 2007), where a greater sense of social support is perceived to be obtainable (Chun & Lee, 2017) and where the people in the network are "more likely to reflect one's opinion" on certain issues (Fox & Warber, 2015, p. 84) than are unknown audiences in online forums. Additionally, individuals have more ways to express their personal opinions on Facebook (see, e.g., Pang et al., 2016) and are not as averse to conflicts when discussing a contentious topic with people they know on their Facebook networks (i.e., in-groups) than they are when discussing the same topic with strangers on a public website forum (i.e., out-groups), for instance.

The finding that social media is preferred over forum websites for personal opinion expression alludes to the process of echo-chambering and opinion polarization, especially when social networking sites largely exchange corroborated information on sociopolitical issues (i.e., conformity hypothesis; Pariser, 2011; Sunstein, 2009) and rarely express dissenting views among members (i.e., silencing hypothesis; Himelboim, McCreery, & Smith, 2013)—proffering new insights into the possible links between the spiral of silence and opinion polarization on social media due to cross-platform opinion expression affordances in online settings. The finding also implies that the spiraling effect due to the silencing of minority opinions on the Internet in general might be due to users choosing to voice their opinions in their own social media networks in a way that facilitates the reinforcement of similar opinions (i.e., conformity hypothesis; Scheufele & Moy, 2000).

A finding contrary to what was hypothesized is that individuals' fear of authority leads to a greater likelihood to comment on Facebook. This suggests the need to consider other plausible reasons for opinion expression on controversial issues on social media beyond what has been found in previous spiral of silence studies (see, e.g., Chun & Lee, 2017; Fox & Warber, 2015; Gearhart & Zhang, 2014; Luarn &

Hsieh, 2014; Pang et al., 2016). One possible reason is that believing their posts on Facebook are limited to a selected or curated group of friends who view the issue in shared social frames mitigates the perceived social threats or fear of authority. Also, individuals might want to present a certain image to their networks on social media by displaying their personal opinions on certain issues without fearing authority. Rather than inciting social isolation, this act of "conviction" and "passion" could lead to favorable perceptions of uniqueness, independence, and personal identity among their "imagined audiences" (Marwick & boyd, 2011). Such ideas are, however, favorable to individuals only to the point where they diverge. Up to a certain threshold, individuals will speak out despite the fear of authority; but at a point where one's opinion is too divergent (i.e., breaking the law), an opposite outcome can be expected—as evinced in this study by the negative relationship between one's fear of breaking the law online and opinion expression on social media.

Limitations and Future Research

This single-issue, single-experiment study tests two sources of opinion climates (public opinion polls and forum comments). In reality, users can be simultaneously exposed to and assessing other opinion climates at any point in time when deciding to express their personal issue opinions. These can include an off-line climate of opinion, such as issue discussions with other people in real life, and a future climate of opinion, in which an individual perceives shifts in the current majority opinion on an issue toward a future dominance of a particular opinion (see, e.g., Glynn et al., 1997; Noelle-Neumann, 1993). Additionally, we can also expect the civility of speech and user engagement to affect opinion climate perceptions and affect one's likelihood to express his or her issue opinions in social media (see, e.g., Ordoñez & Nekmat, 2019). Future spiral of silence studies could consider such propositions when evaluating users' propensity to engage in issue discussions in online settings.

This study investigates individuals' propensity to express opinions on website forums versus a relatively open-group social media platform, particularly Facebook. The potential of the findings to explain individual opinion expression due to the spiral of silence is thus limited to such online settings and might not translate to individual opinion expression in real-life conditions. Future studies should consider examining cross-platform opinion expression on other types of social media platforms, including closed-group platforms such as WhatsApp, WeChat, and Telegram. Additionally, while the sampling of undergraduate participants is necessary to achieve an internally valid and reliable experimental manipulation of the issue stimulus that is relevant and culturally proximal to undergraduates (i.e., the establishment of an LGBT-based student group on campus; e.g., Nekmat et al., 2019), this might limit the generalizability of the findings. These findings could be verified in future studies with a more general sample across different issue types and in a different sociocultural context.

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