

Selective Posting: Willingness to post a message online

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The communication environment in CMC is particularly relevant to the discourses of the traditional communication theory, spiral of silence. This paper embarked on the task of developing an experimental research method to test willingness to speak out in the spiral of silence theory on an online forum and to test subsequent attitudinal and behavioral changes as measured in issue position, climate of opinion perception, and message posting. A 2x2 factorial design (congruent messages vs. incongruent messages and anonymity vs. nonanonymity) tested the willingness to speak out on an online discussion forum. The result of the paper suggested a new theoretical framework, selective posting, and called for the modification of the psychological explanation of spiral of silence.

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In the past decade, online forums have become highly popular among Internet users. There are numerous Weblog hosting companies that offer free Weblog space for individual users and a few of them have grown to become a partner to established media companies and big-budget marketers. In the mean time, many major media organizations, political activist groups, and marketers have started Weblogs on their organizational Web sites to capture a share of the 50 million people, or 30% of the online population, who visit Weblogs every day (comScore, 2005).

Parallel to this, the researchers of computer-mediated communication (CMC) have been increasingly interested in the psychological mechanisms operating on the online discussion forums. Conceptual frameworks proposed to date include group memory (e.g., Dennis and Valacich, 1993; Goldwin, 1994; Stromer-Galley & Foot, 2002), deindividuation or depersonalization (e.g., Flanagan, Tiyaamornwong, O'Connor, & Seibold, 2002; Lee, 2006; Postmes & Spears, 1998; Postmes, Spears, Sakhel, & De Groot, 2001; Turner, 1991; Weisband, Schneider, & Connolly, 1995), and group norms (Beniger 1987; Donath, 1999; Eysenbach & Till, 2001; Goldwin, 1994; Hu, Wood, Smith & Westbrook, 2004; Sproull & Kiesler, 1991; Wellman & Gulia, 1999), just to name a few. While these new conceptual developments provide

much needed frames of reference to the CMC research, some scholars regard this trend as evidence that theories grew out of the traditional mass communication research may not be applicable to CMC (Caplan, 2001).

In reality, however, it is not very clear where offline communication ends and online communication begins. Online forums have increasingly become an important conduit of information and entertainment, which used to be predominantly carried out by the traditional media. Online social networking sites are also facilitating major news events such as political candidate debates and, thus, they are functioning as one of the major news distribution outlets. In addition, many mainstream media Web sites provide a link to prominent political Weblogs and professional reporters monitor those blogs regularly to gauge public opinion. This merging of traditional media and online media suggests that the theories of traditional mass communication are still relevant for many types of CMCs, if not all.

So far, a vast majority of research on online forums have been conducted with a utilitarian view of their function. These studies defined an online forum as a place where people collaborate and produce results through intense discussions (Price, Nir, & Cappella, 2006). Certainly, problem-solving is an important function of online forums. But, a lot of online forums operate as a public sphere where people discuss, gossip, express their ideas, and learn from others about any topic without a specific task at hand. In order to understand this type of communication on online forums, current study employs a traditional communication theory, the spiral of silence (SOS). A multilevel theory such as the SOS has an advantage of investigating online forums from a micro as well as a macroperspective.

The other important purpose of the current investigation is to test the SOS with an experimental method. A great deal of discussion on the theory has been focused on the research method. In particular, researchers frequently question whether survey-based methods commonly employed in the SOS research are appropriate tools to probe the phenomenon. Subsequently, many of them call for an experimental study as an alternative. To fulfill this need, this study develops an experimental research method to test the fear of isolation and willingness to speak out, the essential components of the SOS theory, on an online forum.

The Spiral of Silence Research and Its Challenges

The SOS theory posits that people express their opinions based on their perceptions of the climate of opinion. People are more willing to speak out when they perceive they are on the majority side. On the other hand, people tend to be silent when they perceive themselves to be in a minority because they fear potential isolation. In this process, the media can play a key role by influencing the perception of the climate of opinion. Consonant voices across different media outlets can exacerbate the spiral of silence process by creating the perception that one side is dominant over the other, either correctly or incorrectly (for a general review of the theory, see Noelle-Neumann & Peterson, 2004).

Although the SOS is now fully inducted as a major theory of mass communication, some of the assumptions and conceptual and methodological issues of the SOS are still debated in the research community. One of them is concerned with the fact that in the traditional mass communication process only people with resources or professional access to the media are able to express their opinions. In response to this criticism, Noelle-Neumann (1993) extended her theorem by stating that members of a society should not only have willingness to express their opinion, but they should be *able* to do so as well.

Another major contention in SOS theory is related to the concept of the fear of isolation. In explicating the phenomenon of the SOS, fear of isolation has been identified as a core psychological mechanism. Based on the classical group influence experiments in psychology (Asch, 1951; 1965), Noelle-Neumann (1984) maintained that people with a minority opinion are less willing to speak out because of the fear of isolation. However, research to date has provided mixed support to the argument.

Upon close examination of the fear of isolation, some scholars pointed out the difference in the nature of tasks carried out by the participants in the previous studies. While people were asked to make a *cognitive* judgment in the group influence experiments (Asch, 1951; 1965), people in the SOS studies were asked to make a *moral or aesthetic* judgment, which can be harder to retract. In addition, the experiments were set in private, face-to-face small group situations whereas many SOS studies were conducted in mostly hypothetical and more public circumstances. Hence, the scholars reasoned that fear of isolation could be only one of many factors contributing to the conformity (Salmon & Kline, 1984). Others even speculated that the mechanism behind willingness to speak out may not be the fear of isolation at all (e.g., Kennamar, 1990; McDevitt, Kioussis, & Wahl-Jorgensen, 2003; Taylor, 1982; Tsfaty, 2003). Instead, some proposed another mechanism, such as the fear of appearing ignorant, as an alternative explanation (Salmon & Neuwirth, 1990). In addition, various reasons for speaking out, the flip side of the reasons for not speaking out, have been actively proposed by researchers (Glynn & McLeod, 1984a; Gonzenbach, 1992; Lasorsa, 1991; Moreno-Riaño, 2002; Price et al., 2006; Salmon & Kline, 1984; Scheufele & Moy, 2000).

The methodological challenge to the SOS research stems from the fact that most of the studies were conducted by employing a survey method. Survey is a good choice because it is one of the most effective methods to study multilevel theories such as the SOS (Pan & McLeod, 1991). Also, survey methods have been working fairly well with the conventional operationalization of willingness to speak out. The hypothetical situation introduced by Noelle-Neumann (1993) demanded that people imagined a train compartment or a bar where people socialized with one another. The sanctions for not conforming to the majority opinion during the conversations were easily imaginable in those situations: isolation during the conversation, negative facial expression against minority opinions, verbal attacks, and many other potentially uncomfortable social situations. Survey respondents may have easily hypothesized these situations because these were plausible scenarios in their daily experiences.

Still, many researchers were not fully convinced that the hypothetical questions would generate genuine answers from the respondents and, as an alternative, called for experiments (e.g., Glynn, Hayes, & Shanahan, 1997; Gonzenbach, 1992; Kennamer, 1990; Larsorsa, 1991; McDevitt et al., 2003; Moreno-Riaño, 2002; Salmon & Kline, 1984; Scheufele, Shanahan, & Lee, 2001). Many of them also demanded that the actual behavior of speaking out instead of the behavioral intention of speaking out should be measured as the indicator of willingness to speak out (e.g., Glynn, Hayes, & Shanahan, 1997). Kennamer (1990) even proposed a detailed experimental research design that incorporated willingness to speak out and fear of isolation.

However, to date only a few experiments has been conducted to probe the SOS theory. Even so, they fell short of testing the core thesis of the theory using a behavioral measure in a non-hypothetical situation. For instance, Gonzenbach (1992) found some support for the conformity hypothesis, but did not measure willingness to speak out. Scheufele and his colleagues (2001) tested willingness to participate in a focus group, but only measured hypothetical willingness to speak out. Similarly, Moreno-Riaño (2002) and Oshagan (1996) used a hypothetical situation as the experimental setting without behavioral outcome measures.

Fear of Isolation and Willingness to Speak Out in Online Discussion Forums

The proliferation of online forums in recent years presents a new opportunity to examine the phenomenon of willingness to speak out and the psychological mechanism of the fear of isolation in a very different communication context. First of all, CMC presents an interesting ground where the SOS theory can be tested without the concerns about people's ability to express their opinions. Online discussion forums in particular have often been seen as a place for individual citizens to express their opinions by simply posting a message (Slater, 2007). The commonly held view has been that online forums are carefree places where people visit at their convenience and discuss whatever they like, with little concerns about whether their views are accepted or even paid attention to by others. Although this rather simplistic view of the psychological dynamics on online discussion forums has not yet been systematically examined, the users of online forums are undoubtedly far less restricted in their ability to speak their minds than the users of the traditional media. Therefore, silence on the part of users can be directly interpreted as unwillingness to speak out without the concerns about their inability to speak out.

Another advantage of testing the SOS theory in an online discussion forum is the anonymous nature of the communication. Anonymity of online communication has generated a lot of interest among CMC researchers. Some of them welcomed anonymity as a way to secure personal freedom of expression (May, 1994). Others, on the other hand, pointed out that anonymity can result in negative psychological and behavioral outcomes such as criminal acts, social loafing, deceptions, slow feedback, feelings of impersonality, and poor socialization (Froomkin, 1995; Hayne & Rice, 1997; Kiesler, Siegel, & McGuire, 1984; Latané, Williams & Harkins, 1979; Rains, 2007; Rice, 1988; Wright, 2002).

In the context of the SOS theory, guaranteed anonymity can be one mechanism to eliminate the fear of isolation, which refers to the psychological state in which people are afraid of being psychologically or socially sanctioned for expressing an unpopular opinion. To experience fear of isolation, an individual has to have physical presence and a social identity. If identities are kept anonymous, people are less likely to fear isolation. Also, it is very difficult to physically intimidate someone online. Therefore, anonymity and the lack of physical presence, which is common in online forums, may protect people from any negative sanction.

Indeed, Jeffres, Neuendorf, and Atkin (1999) maintained that the potential sanctions on opinion deviance were most directly experienced in interpersonal settings. In their view, the anonymous nature of many online forums made it very difficult to impose any substantial sanction on individuals who did not have any physical presence. Later, McDevitt and others (2003) supported this argument by examining the effects of anonymity on willingness to express a minority opinion. They reported that, in a synchronous chat room discussion forum, the fear of sanction was not a primary deterrent to willingness to speak out. In other words, if people feel the fear of isolation in online forums, it cannot be due to physical intimidation, gesture, or name calling because people on the forums are anonymous and do not have physical presence.

In online forums, anonymity is often achieved by the use of pseudonyms. In most cases, people should leave a name when they post a message and they choose to create one instead of using their real name. Even if they used their actual name, there is no verification process and also it is virtually impossible to identify who the person is. The use of pseudonyms may not be necessarily or intentionally deceptive, but it can facilitate fraudulent communication due to their untruthful nature (Aronson, 1995; Donath, 1999; Kollock, 1998; Pingree, Hawkins, Yun, Park, & Serlin, 2000; Wellman & Gulia, 1999; Wright, 2002). Although the role of anonymity in interactions among online forum participants has not yet been systematically examined, a few studies have reported that anonymity is related to more critical messages (Lee & Nass, 2002), what and how to say certain contents in a situation (Hayne & Rice, 1997), resistance to pre-established group norms (Lea & Spears, 1991), and the perception of message credibility (Rains, 2007).

In traditional offline communication environments, the SOS theory would predict that a person who perceives his or her own opinion as the minority position does not express an opinion out of the fear of isolation. However, in online communication environments, anonymity may reduce the fear of isolation because forum users do not have to reveal their real identities during their discussion forum use. They can post minority opinions on forums and express themselves without fear of isolation because no one knows who they really are. In addition, they don't even have to worry about being isolated because they cannot be hurt, ridiculed, or embarrassed as long as they keep their real identity anonymous. As Csikszentmihalyi (1991) conceptualized, sanctions as well as isolation are important elements that cause fear of isolation. At the least, anonymity protects someone voicing a minority opinion from material or

physical sanction imposed by the majority. Furthermore, facing potential damage, people can always quit accessing the forum. In sum, online discussion forums provide an opportunity for researchers to scrutinize the role of the fear of isolation in the SOS process by virtue of protecting people from feeling the fear of isolation.

Last but not least, online forums also allow researchers to test willingness to speak out in a nonhypothetical situation by using a direct behavioral measure. When people access online forums, it is highly likely that they will be exposed to various opinions, some congruent and some incongruent with their own opinions. If the majority opinion on the forum is consistent with one's position, the person will read others' messages, verify his or her belief and then either post or not post a message. If the majority opinion is inconsistent with one's position, on the other hand, the person may have to adopt a strategy to deal with the inconsistency between his/her own position and the majority opinion. Unlike the survey respondents who had to labor to imagine themselves in the hypothetical situations even before answering the questions, the forum users are simply introduced to an already constructed conversational environment where they have a full control over how much attention they pay to the conversations and whether to express themselves or not. The measurement of the behavior is also the least intrusive and yet very accurate.

Research Questions

Online forum users can adopt one of several behavioral options regarding message posting when they perceive their view as a minority on the forum. First, they may adopt a simple loafing strategy by avoiding message posting and any other communication activities. The second behavioral option is not to post a message and instead to talk about their online forum experience to others through interpersonal communication and try to reinforce their existing opinion, as a few SOS researchers observed (Glynn & McLeod, 1984b; Salmon & Kline, 1984). Third, they may leave the discussion forum without posting a message and try to sample other online discussion forums to confirm that the accessed online forum is biased and misrepresenting online forums as a whole. There can be various interpretations of these nonposting strategies. For instance, they can attribute that the online opinions are just a minority position different from the real public opinion and, thus, not important. Or, they may feel that it is useless to post a message on the forum because a single online forum will not make any change in real life. Latané, Williams, and Harkins (1979) reported that people tend to optimize rather than maximize their efforts in any group work situation. It can be especially true when people feel low self-efficacy. Indeed, survey studies of the SOS revealed that self-efficacy accounted for a significant portion of the variance of willingness to speak out (Lasorsa, 1991).

The fourth behavioral option is to post a refuting message. This action may be taken for various reasons. It is possible that people with the minority viewpoint may feel that other users of the forum should be aware of different opinions. It is also possible that they post refuting messages to prevent others from being persuaded by

the dominant and disagreeable opinion on the forum. Some minority members with high self-efficacy may even think that they can change others' opinions by writing persuasive messages. If not so daring, they may post refuting messages at least to keep people accessing the forum from perceiving that the disagreeable majority opinion on the particular online forum is a real dominant opinion in general society. Some people may post dissenting message for none of these reasons, but simply because they feel obligated to post messages as functional members of society. The fifth and last behavioral option is to post a congruent message. Albeit rarely, people may change their minds after reading online discussion messages. For instance, if the quality of the messages is high and the forum users' initial position on the issue is not particularly strong, if the users have a strong affinity to the online discussion group, and/or if they feel that the messages on the forum are from the people like them with valid points, they may revisit their positions and adjust them to correspond with the dominant view on the forum. It is also imaginable that people do not change their minds, but still post messages congruent to the group norm just to go with the flow.

Among these many behavioral options, the traditional SOS theory would predict that minority opinion holders on an online forum are more likely to loaf, more likely to engage in interpersonal communication, and more likely to look for other like-minded people online. Yet, one has to consider anonymity that is highly likely to relieve the fear of isolation. If the fear of isolation is indeed the major barrier to willingness to speak out and anonymity shields forum users from the fear of isolation, they may take the fourth behavioral option of speaking out against the perceived climate of opinion. A research question is posed to cast this broad question.

RQ1. Will people speak out regardless of the perceived climate of opinion?

Before presenting specific hypotheses, however, it has to be clarified that there can be three different layers of the climate of opinion perception in online forums. First, there is an *offline* climate of opinion perception or the perceived climate of opinion in the real society. Second, an *online* climate of opinion perception can exist aside from the offline one. Third, users can perceive the climate of opinion within the *particular forum* that they participate in. These three types of the climate of opinion perception may or may not be consistent with one another. Nonetheless, this distinction is an important and potentially meaningful one because, unlike the traditional media with huge audience bases, online discussion forums are relatively easy to be dismissed as a place inhabited by a small group of like-minded people. According to the logic presented above, we present the following two hypotheses concerning the relationship between the perceived climate of opinion and willingness to speak out.

H1.1. People will speak out on an online forum regardless of the perceived offline climate of opinion¹.

H1.2. People will speak out on an online forum regardless of the perceived online climate of opinion.

Although it is likely that people will base their assessment of the climate of public opinion on the messages in their immediate environment inside the discussion forum, the perception can also be influenced by other distant information or perceptual biases such as a discount of forum messages, especially when they are not consistent with their own positions. Therefore, it is considered necessary to examine the influence of immediate forum messages on the willingness to speak out. We propose the following research question and hypothesis to examine whether the presence of all-consenting or all-dissenting messages on an online forum affects people's willingness to speak out.

RQ2. Will minority opinion holders speak out against majority opinions on an online forum?

H2. Minority opinion holders and majority opinion holders are equally likely to speak out on an online forum.

Anonymity has been considered as a defining characteristic of online forum discussions. However, some online forums require users to register a username and provide personal information. We speculate that the registration process will increase the users' awareness of their personal identity on the forum, which, in turn, will increase their susceptibility to the fear of isolation if they are on the minority side. Therefore, a registration process is expected to increase the level of the fear of isolation for the minority opinion holders and thus discourage them from speaking out.

RQ3. Will people speak out more on a completely anonymous forum than on a less anonymous forum?

H3. People are less likely to speak out on an online forum when they have to register before posting a message.

The SOS theory posits that the media play an important role by contributing to the perceptions of the climate of opinion. Because people have a quasi-statistical sense (Neulle-Neumann, 1993), they assess the climate of opinion based on their own opinions. Because the real climate of opinion and perceptions about it constantly interact with each other (Taylor, 1982), people will be influenced by information they receive. An online discussion forum can be an information source, such as the media or other people, that can influence the climate of opinion perception. Therefore, the use of online forums will influence people's perceptions of the climate of opinion online as well as offline.

RQ4. Will online forum exposure influence perceptions of the climate of opinion?

H4.1. Online forum exposure will influence perceptions of the offline climate of opinion.

H4.2. Online forum exposure will influence perceptions of the online climate of opinion.

Method

Research Design

The current study adopted an experimental procedure recommended by Kenamer (1990) with some modifications. A two-by-two factorial design was employed. The first factor was message congruency. In one condition, subjects were exposed to abortion messages congruent with their initial stand on abortion. In the other condition, subjects were exposed to incongruent messages. The second factor was anonymity, which was again manipulated into two levels. In one condition, subjects were required to register before message posting. In the other condition, they were not. By combining the two factors, four different cells were created.

Subjects were measured both before and after the manipulations. The pre-test measured individual participants' issue position on abortion, the perceived climate of opinion, and the fear of isolation in general (offline) and online. The SOS concept related questionnaires were adopted from Scheufele and Moy (2000) and Scheufele, Shanahan, and Lee (2001). The posttest contained questions about the issue position, the manipulation check, the perceived climate of opinion, and the likelihood of political action. In terms of the behavioral outcomes, information about the participants' message posting, registration, the duration of the online discussion forum access, the duration of the posttest access, and the registration page access was all collected (see appendix A).

Experimental Stimulus Operationalization

Anonymity. The level of anonymity (anonymous vs. nonanonymous) was determined by the registration process. If a participant in the anonymous condition clicked the "Post a message" button, a message window appeared immediately. The anonymous condition participants did not have to provide any personal information. If a participant in the nonanonymous condition clicked the button, on the other hand, a registration page popped open, asking personal information such as name, password, e-mail address, gender, age, etc. Participants in the nonanonymous condition were able to post a message only after completing the registration. If they decided not to register, they were able to quit the session (i.e., finish the experimental stimulus) and directed to the posttest questionnaire.

The anonymity manipulation required a special attention. Rains (2007) reported no direct effect of the anonymity manipulation *itself*, but found some effect of the perception of anonymity. In other words, the anonymity manipulation should be made highly salient to be successful. At the same time, one should be mindful of the fact that an overtly salient anonymity operationalization may not recreate the anonymous communication experience of real online forums and lower the external validity of the research. Current U.S. online forums protect anonymity regardless of registration because forums allow pseudonyms. The anonymity manipulation in this experiment similarly allowed the participants to create pseudonym. Therefore, this study emulated a typical registration process on online forums to maximize the

external validity as well as the internal validity of the anonymity manipulation by adopting typical pseudonym use on online forums.

The forum's climate of opinion. Unlike the psychological experiments testing people's conformity in a closed environment (e.g., Asch, 1951; Griffin & Buehler, 1993), the SOS theory needs to examine willingness to speak out in a public setting. Noelle-Neumann (1993) emphasized that emulating the real situation was a key element of testing willingness to speak out. Thus, this study operationalized the climate of opinion with real online forum messages. Stimulus messages were excerpted from the actual abortion topic discussion forum on the New York Times readers' opinion section. After careful ratings and discussions among six coders, 12 postings were selected. Six of them represented the prochoice stand and the other six represented the prolife stand. They were comparable in length and affective intensity (see appendix B). Noelle-Neumann (1993) argued that a clear demarcation of majority vs. minority opinions on any given issue should be presented to test her theory. Therefore, all six postings on the discussion forum were consistently either prochoice or prolife, in order to eliminate any ambiguity in determining the discussion forum's majority position.

Construction of the Online Discussion Forum

There are some legitimate concerns about Web experiments. First of all, it is possible that experimental procedures become inadvertently affected by differences across computers and their system settings used by the subjects. It may be true that certain measurements (e.g., latency test) cannot be reliably made in Web experiments. However, McGraw, Tew, and Williams (2000) reported that the inconsistency across the computers could be compensated by large sample sizes. Second, some researchers warned that experimental research might not be the best method to test the spiral of silence because external validity can be compromised (Scheufele et al., 2001). In the current study, these concerns were seriously dealt with and a lot of efforts were made to eliminate every perceivable source of potential validity threats. For instance, the stimulus forum was very similar to real online discussion forums both aesthetically and functionally. At the same time, the stimulus forum did not include nonessential forum features (i.e., reputation system, access frequency count, and others) to eliminate the sources of potential alternative explanations. In addition, the forum was designed in such a way as not to be mistakenly identified as any specifically known forum (see appendix C). College students are active participants of many high profile online forums and thus mistaking the experimental forum as their favorite forum may prompt them to modify their responses to the stimulus messages. Since previous studies also revealed that various factors such as an unequal gender representation among the writers of a Weblog (Harp & Tremayne, 2006), the Web site design (Goldwin, 1994), and the types of forum participants' e-mail extension (Kollock, 1999) all affect the level of activity and the nature of interaction in online groups, gender-neutral usernames that did not have an e-mail extension were devised for the stimulus messages and the online forum was designed to appear

to be fairly generic and yet functional. To further enhance external validity, the participants were encouraged to access their assigned stimulus forum whenever and wherever they felt convenient, using computers that they used on a regular basis.

Although the SOS theory has been tested with many different topics such as capital punishment (e.g., Oshagan, 1996), college drinking (e.g., Neuwirth & Frederick, 2004), HIV (e.g., Gonzenbach & Stevenson, 1994), the Intifada (e.g., Shamir, 1995), Iran Contra (e.g., Gonzenbach, 1992), the Iraq war decision (e.g., Neuwirth, Frederick, & Mayo, 2007), and the O.J. Simpson criminal trial (e.g., Jeffres et al., 1999), one the most frequently employed topics is abortion (e.g., Salmon & Neuwrith, 1990). Abortion is a controversial and moral issue, which fits well the description that Noelle-Neumann (1993) gave as a good topic for a SOS research. Abortion also meets another criterion, visibility, because abortion is one of the most hotly contested issues in contemporary U.S. media and society.

Experimental Procedure

The participants of this study were recruited from large undergraduate classes at a mid-size university in the Midwestern United States. At the recruitment stage, they were asked to sign a consent form and complete the pretest, which contained questions probing their abortion issue position along with other issue positions. The actual experiment was executed 2 weeks after the pretest to prevent subject sensitization. On the first day of the experiment, e-mails containing two URLs were sent to the participants: one URL for the stimulus forum and the other for the posttest questionnaire. They were told that the purpose of the study was to evaluate a Web site design. Although it may seem to be an unusual setting for participants to read the forum message, researchers intended to filter participants who were not genuinely interested in the abortion topic. Depending on the preassigned experimental condition, each participant accessed one of the four different stimulus forums. After completing the online forum navigation, the participants were asked to go to the posttest questionnaire Web site.

It should be noted that the computer programming scripts were written to prevent any participant from accessing the stimulus again after accessing the posttest questionnaire Web site. In fact, the experimental Web site administrator received e-mails from several participants who wanted to go back to the stimulus forum after reading the posttest questions about the posted messages in the forum. The requests, although not granted to protect the integrity of the data, can be considered as indirect evidence of the external validity of the current research design because they suggested that participants navigated the online forum in a manner very similar to their casual navigation activities.

Results

Manipulation Check

Two questions from the pretest were used to identify each participant's issue position on abortion. They were "To what extent do you support or oppose

the legalization of abortion?” and “What is your stand on the debate between prochoice and prolife?” The answers had to be on the same side of the 11-point response scales to judge that the participant had a stable position on the abortion issue. However, 30 participants (out of 342) answered inconsistently to the two pretest questions. Because it was construed that either the participants did not have a reliable position or they did not pay an adequate amount of attention in answering the questions, they were dropped from the analysis. Also, 54 students (out of the 312) who didn’t complete their participation were dropped. The data were reduced to include only 258 participants. Finally, the manipulation check revealed that only 130 of the 258 students correctly remembered the issue position of the stimulus forum messages in the posttest². Because the participants who could not remember the issue position of the forum were considered not to have read the stimulus messages, the other 128 participants were dropped. Consequently, the final analyses were conducted with the data obtained from the resulting 130 participants³.

The Climate of Public Opinion and Willingness to Speak Out

There were 28 participants (22.2%) who posted a message among the 126 people who identified themselves as either prochoice or prolife on the pre-test. H1.1 and H1.2 examined the relationship between the perceived climate of opinion and willingness to speak out by predicting that people would speak out on an online forum regardless of the perceived climate of opinion offline and online, respectively. Because H1.1, H 1.2, and H2 were proposed in a null hypothesis form, authors adopted interpretive approach for non equivalence testing recommended by Levine, Weber, Park, & Hullett (2008) and Tryon (2001). Significant level (.82) for H1.1 was very high and the poster ratio ranged between 20 to 25 percent (see the numbers in brackets in table 1). It can be deemed to be equivalent to null hypothesis and, thus, H1.1 can be supported. The result confirmed that the perceived climate of opinion offline did not affect willingness to speak out.

However, H1.2 showed a slightly different result. Significant level (.16) for h1.2 was closer to typical null hypothesis testing (.05). Also, the poster ratio was lower (9%) for the posters who perceived climate of opinion online as minority (see the numbers in brackets in table 1). Thus, the result deemed to reject H1.2. In other words, people’s perceptions about their position as being in the majority or the minority in the cyberspace influenced their willingness to speak out measured by the message posting behavior.

The influence of the stimulus forum climate of opinion on willingness to speak out was assessed by H2. Specifically, it predicted that people would be equally likely to speak out on an online forum whether their position was with the majority or the minority. However, the results revealed a difference between people whose opinions were same as the majority and those whose opinions were in the minority. More people in the congruent message condition generated postings than people in the incongruent message condition ($N_{\text{incongruent}} = 8[14\%]$, $N_{\text{congruent}} = 20[30\%]$).

Table 1 Climate of opinion perception, fear of isolation, and message posting behavior

			Posted a message (N = 28)	Didn't post a message (N = 98)	χ^2	Sig. level N = 126
Perceived climate of opinion: frequency	Society	Majority	15 [25%]	46	.4	.82
		Neutral	5 [20%]	19		
		Minority	8 [24%]	33		
	Online	Majority	17 [25%]	49	3.72	.16
		Neutral	7 [29%]	17		
		Minority	4 [9%]	32		
Message posting behaviors: frequency	Incongruent	8 [14%]	49	4.04	.04	
	Congruent	20 [30%]	49			
					F	Sig.
Perceived climate of opinion	Society	5.48(1.33)	5.05(1.28)	2.4	n. s.	
	Online	5.90(1.19)	5.23(1.34)	5.68	*	
Fear of isolation	Society	5.12(1.02)	5.00(1.04)	.3	n. s.	
	Online	3.96(1.05)	4.41(1.44)	3.42	+	

⁺ $p < .10$, * $p < .05$, ** $p < .01$

Note: Numbers in perceived climate of opinion and fear of isolation table are means, with standard deviations in parentheses.

Numbers in bracket represent the percentage posters in each row.

N = 126 because 4 participants had neutral issue position.

$\chi^2 = 4.04, p = .04$, see Table 1)⁴. The participants who were in a congruent condition were twice more willing to post a message. This result supported the SOS explanation that majority opinion holders were more willing to post a message, while minority opinion holders were less likely to post a message. Thus, H2 did not receive support. People were more likely to post a message when they were surrounded by congruent messages than by incongruent messages.

Anonymity and Willingness to Speak Out

H3 posited that people would be less likely to speak out on an online forum when they have to register before posting a message. However, the results revealed no statistically significant difference between the registration and no-registration conditions. In other words, the registration process did not appear to have dampened the participants' willingness to speak out. Therefore, H3 was not supported.

The Forum's Climate of Opinion and the Perceived Climate of Public Opinion

H4.1 and H4.2 predicted that the messages posted on the online forum would influence the perceived climate of opinion offline and online. Indeed, the perceived climate of opinion was influenced by the stimulus messages. Pro-life supporters perceived the climate of opinion to be more pro-life when they were exposed to pro-life messages than when they were exposed to pro-choice messages. Similarly, pro-choice supporters perceived the climate of opinion offline ($\text{Mean}_{\text{prolife, incongruent}} = 5.68$, $\text{Mean}_{\text{prolife, congruent}} = 4.61$, $\text{Mean}_{\text{prochoice, incongruent}} = 5.01$, $\text{Mean}_{\text{prochoice, congruent}} = 5.38$, $F = 14.87$, $p < .01$, Table 2) and online ($\text{Mean}_{\text{prolife, incongruent}} = 5.69$, $\text{Mean}_{\text{prolife, congruent}} = 4.33$, $\text{Mean}_{\text{prochoice, incongruent}} = 5.35$, $\text{Mean}_{\text{prochoice, congruent}} = 5.96$, $F = 13.43$, $p < .01$, Table 2) as more pro-choice when they were exposed to pro-choice messages than when they were exposed to pro-life messages. Therefore, it was concluded that both H4.1 and H4.2 were supported.

Additional Analyses

Fear of isolation and willingness to speak out. The trait level of fear of isolation and its impact on willingness to speak out were examined. On average, the participants of this study did not exhibit a high level of fear of isolation either online or offline. But, when the two were compared, fear of isolation online ($M = 4.31$, $s.d. = 1.16$) was significantly lower than fear of isolation offline ($M = 5.02$, $s.d. = 1.03$; $t(125) = 6.67$, $p < .01$). Also, although it was only marginally significant, participants who posted a message on the forum reported a lower level fear of isolation online ($M = 3.96$, $s.d. = 1.05$) than participants who did not post a message ($M = 4.41$, $s.d. = 1.44$; $F = 3.42$, $p < .10$, see Table 1).

Interaction between the pre-experimental issue position and online forum messages. There were significant reinforcement effects of exposure to the online forum messages when the stimulus messages were incongruent to their existing position. The participants who were exposed to incongruent messages strengthened their existing issue position ($\text{Mean}_{\text{prolife, incongruent, size of position change}} = 2.21$, $\text{Mean}_{\text{prochoice, incongruent, size of position change}} = 1.85$, $F = 19.63$, $p < .01$), whereas participants who were exposed to congruent messages did not significantly strengthen their issue position (see Table 2).

Balance of the argument. As a supplemental analysis, the balance of the arguments in the postings was also coded. The concept of balance was operationalized whether the posting included any opposite view point (5-point scale with 1 as low and 5 as high). The result indicated that people incorporated opposite arguments more frequently when they were exposed to incongruent opinions ($\text{Mean}_{\text{congruent}} = 1.50$, $s.d._{\text{congruent}} = 1.10$, $\text{Mean}_{\text{incongruent}} = 3.07$, $s.d._{\text{incongruent}} = 1.93$, $F = 6.82$, $p < .05$) without changing their original issue position.

Discussion

This study tested the SOS theory in an online discussion forum, a fast emerging communication environment, by employing an experimental method. Consistent

Table 2 Perceived climate of opinions, issue position change, and political action likelihood in post-test

		Prolife		Prochoice		F	Sig. N = 123
		Incongruent (N = 28)	Congruent (N = 22)	Incongruent (N = 28)	Congruent (N = 45)		
Perceived climate of opinion	Society	5.68(.24)	4.61(.27)	5.01(.24)	5.38(.19)	9.10	Congruent/incongruent**
	Online	5.69(.27)	4.33(.31)	5.35(.27)	5.96(.22)	13.43 5.68	Congruent/incongruent** Prolife/prochoice*
Issue position change		Congruent				19.63	Prolife/prochoice of incongruent**
		Prolife (N = 28)	Prochoice (N = 28)	Prolife (N = 22)	Prochoice (N = 45)		
		2.21(.58)	1.85(.59)	.50(.66)	.56(.46)		
Political action likelihood		Prolife (N = 50)		Prochoice (N = 73)		F	Sig.
		4.57(2.41)		3.67(2.19)			
						4.73	*

+ p < .10, * p < .05, ** p < .01

Note: Numbers in table are means, with standard errors and deviations in parentheses.

N = 123 because 3 participants did not complete the post-test.

with the rationale that the lack of physical presence in an online forum would insulate people from the fear of isolation and thus enable them to speak their minds regardless of the perceived climate of opinions, the data confirmed that people were equally willing to speak out in an online forum whether they perceived their opinion offline as in the majority or in the minority. At the same time, the perceived climate of opinion online and the immediate climate of opinion in the forum influenced the message posting behavior. People were less likely to post a message when they perceived their opinion as minority online or the messages on the forum were the opposites of their opinions. The forum messages were also found to affect the perceptions of the climate of opinion. Messages that were consistent with the original positions of the participants increased the perception that their position was the majority one. It seems to be that the immediate forum or general perceived climate opinion online influenced the willingness to post a message on the forum.

The higher number of posts made by the people in the congruent message condition, as opposed to the incongruent condition, is consistent with what was reported in previous studies that examined other online media communications such as online chat (e.g., Lee & Nass, 2002). At the same time, this finding also rebukes the common notion that people express their opinions in online venues without any reservation.

Still, the questions related to the fear of isolation were not clearly answered by this investigation. Since online forums technically guarantee anonymity, there is no reason for participants to experience the fear of isolation. However, it appears that it is inevitable for human beings to have a certain degree of fear of isolation whether online or offline. It is possible that people may bring their norms and habits of offline social interaction to their online communications. A difference in the level of the trait fear of isolation was also observed between message posters and lurkers. People with low fear of isolation were more likely to post a message than people with high fear of isolation.

Whereas the message-issue position congruency manipulation generated interesting findings, the other manipulation, registration before message posting, did not create any difference in the message-posting behavior. People posted a message when they felt that it was necessary, even though doing so required them to reveal their personal identity to the forum administrators. Participants might have felt comfortable providing personal information such as name and email because the registration process did not ask any sensitive information and/or they knew that their navigation was in the context of academic research. It is also possible that the manipulation was not salient enough to have an impact.

Also, it should be noticed that the results from the behavioral measures of this study can be adequately accounted for by the SIDE model. Although they did not control anonymity, Price et al. (2006) proposed the social identity theory as the best psychological explanation of online forum activities so far. Further study on this model in the context of congruent and incongruent online forum messages will deepen our understandings of the psychological process of the message posting behavior in the context of public opinion formation.

In the end, the results of this study suggest that online discussion forums are not as ideal as many people think. In an online forum where a majority opinion exists, users may decide not to post a message against the majority opinion. Consequently, this inaction will increase the spiral of silence in online forums, which will render the minority opinion to become less and less visible. At the same time, people who hold the majority opinion are more likely to post a message, which would, in turn, only increase the number of majority opinion postings on the forum. In the end, forum messages that consistently advocate one position against the other affect how individuals assess the climate of opinion in the cyberspace outside of the forum and the wider real society. This finding may have a more serious implication if we consider that users of online news sites are already highly fragmented and visit the same sites repeatedly instead of widely surveying the blogosphere (Tewksbury, 2005).

The one sliver of hope was provided by the fact that people were willing to speak out regardless of their perceived climate of opinion offline. It means that the opinions in the immediate environment may influence forum users' posting behavior, but not the perceived climate of opinion offline. As the SOS theory posited, situational factors may play more important roles than the general climate of opinion perception in people's willingness to speak out (Neuwirth, Fredrick, & Mayo, 2007).

Limitations and Implications

The low success rate of the manipulation check was one of the concerns of this study. At the same time, it is an interesting phenomenon that may have some implications for future studies that will further explore online forums. Probably, participants who passed the manipulation check were those who were more likely to read about abortion in real online forums because all the participants accessed the online forum in their natural Web navigation environment. It was speculated that only some people were interested in the abortion topic and were involved in online forum activities. Therefore, it was probably how people selectively expose, perceive, and engage in online forums.

Some researchers proposed the possibilities of Internet both providing greater openness or closure of communication experience (Slater, 2007). The experimental forum stimulus of this study had openness because it was supposed to be accessible by anyone. However, the result indicated that the people tended to use the forum as if it were a closed environment. People were more likely to post a message when the existing forum messages were consonant with their existing position. Indeed, the result of this study hinted potential disservice of online forums for the public. For instance, the low number of participants who passed the manipulation check may be just one symptom of the selective attention and retention taking place in actual online forums. This question seems to be especially important because the level of active navigation and involvement required for Internet use can create a unique media content viewing experience for each individual. Some

people may be inclined to read online forum messages that are only consistent with their existing opinions (See Sunstein, 2007 for further selective exposure argument), while others may prefer to read messages that are opposite to their opinions. Thus, their selective exposure and selective attention to Web content could be entirely different due to individual differences in exposure and attention preferences.

In addition to selective exposure and selective attention, the results of this study also hinted at a selective perception process on online forum messages. Participants who were exposed to incongruent messages actually strengthened their original issue position rather than compromising or negotiating their original issue position. Within the scope of the experimental design and the abortion topic, participants were not ready to take the opposite side's opinion into consideration or they took it into considerations, decided against it, and strengthened their original position. Consequently, selective exposure only to congruent online forums, selective attention to the message congruent to the existing issue position, selective perception of forum messages, and *selective posting* of congruent messages on online forums will impose a serious threat to the ideal of an open market place of ideas on the Internet as SOS theory posited many decades ago.

As Slater (2007) posited, the original SOS proposition needs to be modified to meet the current multichannel media environment. It is true that relatively small numbers in the audience for a Weblog or a discussion forum means that they cannot be put into the SOS model as main stream media. However, people choosing the behavioral option to post is similar to the original SOS theory and the aggregated number of Weblogs and discussion forums may be able to represent the mainstream media as the original spiral of silence theory proposed. Unfortunately, there has been no evidence which indicates that the multichannel environment encourages exposure to incongruent messages and participation in constructive debates online.

The result of this study only marginally supports the fear of isolation in SOS theory. However, the marginal evidence does not invalidate spiral of silence theory as a whole. On the other hand, the results strongly indicate a selective posting tendency of the forum participants. It may mean that the multi-level theory of the spiral of silence can be supported with some improvements in the fear of isolation argument. Indeed, the results of this study indicate that important aspects of SOS theory are supported, such as effects on the perception of the climate opinion and the willingness to post a message.

While researchers have articulated hopes (e.g., Sinekopova, 2006) and have provided some evidence to support those hopes (e.g., Benkler, 2006; Ellis & Maoz, 2007) that the transformation of offline public sphere to online should facilitate places where individuals can have an equal chance to participate and resolve differences, this paper provides a rather grim perspective on this ideal. It seems like online forums have the potential to engender negative consequences to our democracy by further polarizing people's opinions on important issues.

Notes

- 1 The authors acknowledge that a null hypothesis is not a typical way to present a hypothesis, but some proposed research questions (H1.1, H1.2, and H2) can be best tested in the form of a null hypothesis. Consequently, these hypotheses were tested with more interpretive equivalence testing method designed for null hypothesis testing (see result section).
- 2 A large proportion of unusable data was expected because the authors neither forced the participants to pay attention to the forum messages nor gave directions to read the messages closely. The authors intended to emulate a natural navigation experience that did not impose any external pressure. To secure both internal and external validities, the participants were told that the purpose of the study was to test the usability of a Web site. Thus, the experimental situation was similar to a typical Web site use where people accessed and read Web content only when they were interested in it. Nevertheless, the methodological problem of emulating selective exposure for experimental study is an uncharted territory. Further development of research method on this topic is strongly desired.
- 3 Each cell contained approximately 32.5 participants in this 2 by 2 factorial design ($N_{\text{congruent, anonymity}} = 38$, $N_{\text{congruent, non-anonymity}} = 31$, $N_{\text{incongruent, anonymity}} = 27$, $N_{\text{incongruent, non-anonymity}} = 30$). The cell sizes provided a proper sensitivity detecting significant findings at the 0.95 power level (Type II error probability, see Cohen, 1988).
- 4 Again, authors adopted interpretive approach for testing H2.

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Appendix A. Measurements

Pre-test Questionnaire

Issue position

- To what extent do you support or oppose the legalization of abortion?
- What is your stand on the debate between prochoice and prolife?

Perceived climate of opinion online

- How many people on the Internet do you think support the legalization of abortion?
- Out of every 10, how many people on the Internet do you think support the legalization of abortion?
- Estimate the percentage of people on the Internet who support the legalization of abortion.

Perceived climate of opinion

- How many people in our society do you think support the legalization of abortion?
- Out of every 10, how many people in our society do you think support the legalization of abortion?

- Estimate the percentage of people in our society who support the legalization of abortion.

Fear of isolation

- In general, I worry about being isolated if people disagree with me.
- In general, I don't worry about other people avoiding me.
- In general, I avoid telling other people what I think when there's a risk they'll avoid me if they knew my opinion.
- In general, I enjoy avoiding arguments.
- In general, arguing over controversial issues improves my intelligence.
- In general, I enjoy a good argument over a controversial issue.
- In general, I try to avoid getting into arguments.

Fear of isolation online

- On online, I worry about being isolated if people disagree with me.
- On online, I don't worry about other people avoiding me.
- On online, I avoid telling other people what I think when there's a risk they'll avoid me if they knew my opinion.
- On online, I enjoy avoiding arguments.
- On online, arguing over controversial issues improves my intelligence.
- On online, I enjoy a good argument over a controversial issue.
- On online, I try to avoid getting into arguments.

Posttest questionnaire

Issue position

- To what extent do you support or oppose the legalization of abortion?
- What is your stand on the debate between prochoice and prolife?

Manipulation check

- What was the discussion board messages' stand on the debate between prochoice and prolife?

Perceived climate of opinion online

- How many people on the Internet do you think support the legalization of abortion?
- Out of every 10, how many people on the Internet do you think support the legalization of abortion?
- Estimate the percentage of people on the Internet who support the legalization of abortion.

Perceived climate of opinion

- How many people in our society do you think support the legalization of abortion?

- Out of every 10, how many people in our society do you think support the legalization of abortion?
- Estimate the percentage of people in our society who support the legalization of abortion.

Political action likelihood

- Talk to others about the issue.
- Try to persuade others to support your position.
- Sign on petitions.
- Wear a badge or post a bumper sticker.
- Write, call, or email to mass media or politicians.
- Participate in on-campus rallies.
- Donate money or volunteer for prolife or prochoice organizations.

Appendix B. Stimulus content

a. Prolife	
username	content
rickster	Abortion advocates tell us that 25 million women have had abortions since Roe v. Wade but do not translate that into the death of more than 40 million unborn children. When they do mention the unborn child, they describe a 5-week-old as a “formless mass,” not noting that at 12 weeks the unborn child is clearly human, even to the eyes of the most hard-core prochoice advocates.
msutton	Absolutely true. Cheers!
nmcvaugh	People usually think a woman only two choices concerning an unwanted pregnancy: “choosing between aborting a pregnancy and raising an unwanted child.” In fact, there are three options open to a woman, the two above and the third, which is to bring the baby to term and give up the “unwanted” child for adoption by parents who would consider the child “wanted.”
emmett	Yes, abortion is legal. Women who have abortions and doctors who perform them are no longer breaking the law in most cases. But the fact that a woman who has an abortion no longer faces the possibility of spending time in jail does not make choosing an abortion a “right,” up there with life, liberty and the pursuit of happiness. Feminists sometimes go too far in their desire to take charge of their lives. In depenalizing abortion, perhaps we have dehumanized ourselves.
ncnate	I have to agree with you on that.

Appendix B. continued

username	content
akadmon	<p>Some people suggest that opposition to abortion is a religious position. To the contrary, it is based on the irrefutable facts of genetics, embryogenesis and human development testifying to the origin of the new human being at fertilization joined to the moral principle that directly and deliberately destroying an innocent human being is wrong.</p> <p>The same moral reasoning, with no needed reference to religion, leads us to reject slavery; child abuse; ethnic, racial or religious cleansing; racism and anti-Semitism. If a politician maintained that "I'm personally opposed to slavery, but I wouldn't impose that (supposedly religious) view on others," we would simply laugh. For a large portion of the citizenry, the same is true for abortion.</p>
b. Prochoice	
rickster	<p>It's women's health being put at risk by a pregnancy. It's women's career being put on hold during maternity leave. It's my body. There's a reason that's a rallying cry for the prochoice movement.</p> <p>Should only healthy women in their child-bearing prime be subject to injunctions against abortion, or could a woman with significant health problems still have to go through an unwanted pregnancy if the man really wants the baby?</p> <p>All the law can require of a reluctant father is money. It is a nightmare to imagine that it could require a woman to relinquish control over her body and life in order to become an unwilling vessel.</p>
msutton	Absolutely true. Cheers!
nmcvaugh	For the first two trimesters the Supreme Court has recognized a woman's right to choice. Regarding the last trimester, the court said the states have the right to make the rules. People who are against a woman's reproductive rights are the ones who are extreme, and it shows that they do not accept the compromise of Roe v. Wade.
emmett	Because Americans have the right to make their own choices, every mother has the right to decide if she can take on the responsibilities of having a disabled child. We should put our energy into finding cures for the disabilities, instead of debating a personal choice of abortion. I know that if I became pregnant, I would want the best of both worlds, to be able to have a child and to not worry about his having a disability.
ncnate	I have to agree with you on that.
akadmon	The majority of women who get abortions are young, poor and minorities. It is no coincidence that these same demographic groups are also less likely to have access to sex education and contraception that can prevent unwanted pregnancies in the first place. Every law restricting women's reproductive rights—whether in the form of parental notification, limiting access to emergency contraception or laws that make it difficult to open clinics—is most harmful to those women who have already been failed by society. People with the means to travel long distances and pay high fees to have an abortion will continue to do so, while those who cannot will continue to suffer.

Appendix C. A stimulus screen shot

