TESTING THE SPIRAL OF SILENCE
IN THE CONTEXT OF
COMMUNICATION MEDIATED COMMUNICATION

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This study examined the applicability of the spiral of silence theory in a computer-mediated communication (CMC) context. It explored the function of anonymity in CMC and questioned the "fear of isolation" assumption of the spiral of silence model. By linking the two bodies of literature (the spiral of silence and CMC), it explored whether or not the spiral of silence worked in the CMC context.

The experiment measured the fear of isolation and the perceived minority status as independent variables and investigated their effect on three aspects---minority opinion expression, topic selection and the order in which controversial issue was brought up in the conversation in two communication contexts (FTF vs. CMC). By elaborating on the latter two dependent variables, this study suggested new ways of conceptualizing and operationalizing "speaking out."

The study revealed findings inconsistent with the predictions. It did not find a strong spiral effect in either communication context, like most of the previous spiral of silence research. There was no significant difference on the minority opinion expression in FTF versus CMC. Fear of isolation and the perceived minority status did not play a role in influencing minority opinion expression and the order of bringing up the controversial issue in both communication settings.
In the opposite of the hypothesis, the results of the study indicated that the communication context did affect the topic selection—People in FTF were more likely to talk about the controversial issue than people in CMC. Since topic selection was conceptualized as a mean of “speaking up,” this illustrated a less salient spiral effect in FTF. Importantly, it appeared that two traditional independent variables— the fear of isolation and the perceived support of one’s own opinion could not account for this increased willingness to talk about controversial issue in FTF. Potential reasons for this observed difference in FTF vs. CMC are discussed. Methodological considerations and implications for future research also are discussed.
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CHAPTER 1

INTRODUCTION

This study examines the applicability of the spiral of silence theory in a computer-mediated communication (CMC) context. It examines the function of anonymity in CMC and questions the "fear of isolation" assumption of the spiral of silence model. By linking the two bodies of literature (the spiral of silence and CMC), it explores whether or not the spiral of silence works in the CMC context.

First of all, instead of regarding the fear of isolation as an assumption, this study actually measures it as a variable. It investigates, under the anonymous CMC context, whether or not the fear of isolation is as strong as in a face-to-face (FTF) setting. That is, will the fear of isolation vary depending on the nature of communication context? This is particularly important because the fear of isolation is predicted to influence the minority opinion.

Since this study employs the experimental method and creates a real discussion setting, it brings two new dependent variables which have not been widely investigated in prior research: topic selection in discussion and the order in which controversial issues are brought up in the conversation. It probes how the fear of isolation and the perceived
minority status work differently in these two different communication contexts. By elaborating on these two variables, the study suggests new ways of conceptualizing and operationalizing “speaking out.”

Being aware of other factors that also influence the interactions in the small group discussion, such as face concern, communication apprehension, expectation for politeness, and the payoffs and tradeoffs of silence versus speaking out, this study focuses on what makes the difference of the minority opinion expression, topic selection and the order of bringing up the controversial in two communication contexts (FTF vs. CMC). Data from 230 individuals in 40 discussion groups (half FTF and half CMC) obtained from an experiment are used to test the hypotheses.
First we will have a brief overview of the spiral of silence. The spiral of silence model is an enduring topic in the communication field. It asserts that individuals holding a minority opinion will be compelled to conform to the opinion held by the majority or else will remain silent to avoid social isolation (Glynn & McLeod 1985; Salmon & Kline 1985). This theory is very influential, having attracted considerable scholarly attention and produced a rich literature.

The spiral of silence model has the following assumptions, which are presumably testable through empirical investigation:

1. Society threatens deviant individuals with isolation.

2. Individuals continuously experience fear of isolation, which usually makes people willing to heed the opinions of others and to suppress expressions of minority opinions (Noelle-Neumann, 1993).

From these, we can see that fear of isolation is one of the key assumptions of Elizabeth Noelle-Neumann (1993). She claimed that individuals have an inborn fear of social isolation. If the individual perceives that his or her personal convictions are shared by the majority, he or she will be willing to express the opinion in public. On the other
hand, if the perception is that the opinion represents a minority viewpoint, he or she will be reluctant to express the opinion publicly. This causes the minority opinion to gradually become silent.

To support her augments, Noelle-Neumann (1984) referred to the literature on group dynamics, and especially social conformity. This research is the foundation of her theory.

Scholars have conducted numerous studies to test the spiral of silence. The prior research has mainly been conducted in three categories: mass media and mass communication, the individual and interpersonal communication (especially face-to-face interaction) and implications for public opinion, including contemporary applications (Salmon & Glynn, 1996). The CMC context has not been examined by previous studies. Most of the previous studies on the spiral of silence have employed the survey method. Specifically, willingness to express opinions has been measured through techniques such as the train test, in which people are asked a hypothetical question about whether or not they would be willing to express their opinions to a stranger on a train.

But those studies fail to provide much empirical support for the theory. In the past 25 years, the spiral of silence theory has generated considerable empirical research but with inconsistent findings. A recent meta-analysis of over one hundred tests of this hypothesis found an average correlation of only .03 between how much a person perceives support for his or her opinion and the person’s willingness to express that opinion publicly. The finding was characterized as providing weak to negligible support for this part of the theory (Glynn, Hayes & Shanahan, 1997). To further complicate matters, Price and Allen’s (1990) research showed that members of minority groups
actually may be more willing to speak out when they perceive that support for their viewpoint is declining. In short, this theory itself is controversial and has not been readily verifiable through traditional scientific hypothesis testing (Salmon & Glynn, 1996).

Limitations of Previous Spiral of Silence Research

Why have the previous empirical studies not provided consistent findings? The reason may lie in both the assumptions of the theory itself and the methodology that researchers have employed to test the theory. Below some criticisms of the theory are discussed.

Nature of The Issue

Although Noelle-Neumann indicates in her theory that dealing with issues with a moral component is a necessary condition for the spiral effect to work, her argument is based on the social conformity research that deals with non-moral issues. Her spiral of silence model is based upon Asch’s small-group conformity research. She raised Asch’s (1951) experiments as evidence that fear of isolation exists. But researchers (e.g., Glynn & McLeod, 1985; Salmon & Kline, 1985) argue that those experiments only deal with non-moral issues such as the length of a line, while Noelle-Neumann herself explicitly indicates that the spiral of silence theory is effective in influencing opinion formation and expression specifically for issues with a moral component. Simply applying the findings obtained from non-moral issues to issues with a moral component may not be appropriate.
Absence of Fear of Isolation Measures

There are many factors that can influence the opinion expression in public, for instance, communication apprehension and willingness to communicate, which are personality-based predispositions with major impacts on human communication behavior. High willingness to communicate is associated with increased frequency and amount of communication and positive communication outcomes, whereas low willingness to communicate is associated with decreased frequency and amount of communication and negative communication outcomes (McCroskey & Richmond, 1990).

Noelle-Neumann's spiral of silence does not focus on those individual traits. Instead she uses the fear of isolation, which is also one of the key assumptions of her theory, as one of the predictors of the minority opinion expression. Her theory implies two main points: first, the fear of isolation is omnipresent in the society and inherent in every individual's mind; second, people can employ a quasi-statistical sense to accurately feel the threat of isolation from the external world. But these assumptions have been called into question by some scholars. Splichal (1999) argued that Noelle-Neumann does not justify her hypothesis of the societal omnipresence of the fear of isolation, which is assumed rather than observed and tested. Glynn and McLeod (1985) suggested that fear of isolation should be treated as a variable rather than an assumption. Unfortunately, so far, research has widely ignored this suggestion (Scheufele & Moy, 2000). Most studies simply assume that fear of isolation plays a role without testing the assumption empirically (Scheufele, Shanahan & Lee, 2001). Only few studies (Moy, Domke, &
Stamm, 1999; Neuwirth, 1995) operationalized fear of isolation as a variable in tests of
the spiral of silence. In those studies researchers have found it is indeed negatively
related to publicly voicing a perceived minority opinion.

The lack of direct measurement of fear of isolation is a weak point of the
empirical studies on the spiral of silence. Without those data, we cannot know whether
fear of isolation varies when the communication context changes. Is the fear of isolation
omnipresent or conditional? To be more specific, is the fear of isolation still present in
the anonymous CMC context? This question will not only, to a large extent, determine
whether researchers can observe a spiral effect in online community, but it can also
directly challenge the theory itself. If the fear of isolation is omnipresent, we should be
able to observe it in all kinds of communication contexts, including CMC. If fear of
isolation is conditional, CMC may serve as one context in which it is less prevalent or has
less of an effect. At the same time, if fear of isolation is conditional then the spiral of
silence theory needs to be adjusted with regard to its assumptions.

Hypothetical Setting vs. Real Discussion Context

Small group communication research reveals that responses occurring in a
hypothetical communication situation may be different from those obtained by using
other methods of data collection. Hayes and his colleagues’ (2000) study found that this
is the case for the spiral of silence research. When given a list of six potential topics to
discuss with a real group of people, the participants reported a greater willingness to
discuss a topic if they perceived greater support for their own opinions on that topic. The
relationship they observed was much larger than the average correlation reported in a
meta-analysis conducted by Glynn and her colleagues (1997).
The hypothetical setting in previous spiral of silence studies has been criticized in many articles (e.g. Salmon & Glynn, 1996; Scheufele et al., 2001). Most previous studies ask participants to imagine a hypothetical situation (e.g. the train test, which is a dyadic communication situation) and report how they would behave in that situation using some kind of self-report method. But the distinction between real and hypothetical will influence the validity of research. The hypothetical nature of the questions posed to participants in previous research may not adequately capture the more genuine social pressures one might feel in this situation. That is, people may not appreciate the power of the situation and thus underestimate how unwilling they would be to express an unpopular viewpoint around others. Thus, the relationship between perceived support for one's own opinion and willingness to express may be stronger when participants are in a "real" situation (Hayes, Shanahan, & Glynn, 2000).

Survey vs. Experiment

The method that researchers have employed to test the spiral of silence theory also probably contributed to the traditional usage of hypothetical setting. Most of the previous empirical studies that have been conducted have employed the survey method. Glynn et al. (1997) indicated that the survey method typically used to capture spiral effects dilutes the power of the opinion climate too much to produce a real difference. The survey context only relies on people's self-report of willingness to speak up without directly measuring actual opinion expression. In this sense, they only look into the self-reported latent readiness of the participants to behave publicly in a particular way, but do not examine the actual behavior in a public conversational setting. Therefore, placing participants in a real conversation context may be a better way to investigate the realistic
willingness to speak up publicly under majority pressure. The small group discussion is
closer to the original setting from which the spiral of silence was derived because the
foundation of Noelle-Neumann's theory is small group dynamics (see Asch, 1951, 1955).

**Speaking Out vs. Remaining Silent**

Silence as well as expression of political opinions in everyday communication
would seem to be predicated on a host of structural and functional features of
communication. Given that silence as well as expression of political opinion is both
social and cultural, their meaning and pragmatic force should depend upon how such
silence and articulation is understood by the participants and wider members of the
community, and how political opinions are actually expressed, interpreted, and used in
interaction (S. Kline, personal communication, August 5, 2003)

Basso (1990) examined the differential value of silence across different cultural
communities and illustrated the positive important value of silence. Based on that, Kline
pointed out that the meaning and force of silence rests initially on the socially constructed
and historically embedded meaning of silence as a communicative act within the
communicative activities of the group. Therefore we could examine the everyday
politics-relevant communicative activities and speech events and scrutinize the role of
silence vs. speaking out within those activities.

As fundamental communicative acts, silence and opinion expression carry with
them relevant felicity conditions, or situational expectations. Matters of normative
appropriateness, situational duties and obligations, sincerity, and prepositional form are
background assumptions used to interpret the meaning of silence and expression as they
are situated in a line of joint conversational activity. So for instance, is it my obligation or
responsibility to express an opinion now, will I be heard as sincere, is it called for in the situation, is my utterance clear, will my utterance enact my goals, intentions, and the like, all form a backdrop for one’s decision to speak or not (S. Kline, personal communication, August 5, 2003).

The traditional method used to investigate whether or not people speak out in public is to examine people’s willingness to express a minority opinion. But, is the spiral effect only demonstrated in what opinion the minority expresses on value-laden issues? Is there any other way to conceptualize “speaking out?” To address these questions, we proceed by first reviewing Noelle-Neumann's original description on this aspect and then try to extend the notion of “speaking out.”

Noelle-Neumann (1993) emphasized that “we must understand what is meant by talking and by keeping quiet in the broadest terms” (p. 22). She argued that actual action (e.g. wearing a campaign button, putting a bumper sticker on a car, openly carrying around a newspaper which has a well-known political slant) is also a way of talking, while no action (not doing these things) is a way of being silent. Here she suggested that people’s choice to speak up or remain silent can be demonstrated in many different ways. Applying this to the small group conversation, we can ask: is there any other way that people can keep silent besides not expressing an opinion on a particular topic when that topic is the object of conversation?

Prior studies on the spiral of silence have usually created a hypothetical setting and presented only one controversial issue to the participants. Then, they are asked whether or not they would express their opinion on that topic. Under such circumstances in which a controversial issue is already the topic of conversation, participants are forced
to address this issue. They are deprived of the right to select the topics of discussion in the first place. Actually this situation may be infrequent in the real world. In a real world discussion, there are a rich variety of possible topics for people to choose to initiate or maintain the conversation. People use their personal judgment when choosing conversation topics, and they are often not those with a moral component. Actually, people are often taught not to talk about controversial issues in a public setting. Since the freedom people have differs so much from the hypothetical situation in most spiral of silence research, research should try to create a real world conversation by giving people the right to select topics for their conversation. Then, researchers may observe whether or not subjects choose to bring up controversial topics.

Clark’s (1979) influence research substantiates this argument. He conducted two studies to explore the impact of self interest and desire for liking on the selection of communicative strategies. The first one asked the subjects to compose a message in response to one of the experimental situations. He found that the desire for liking altered usage of communicative strategies. In the second study, subjects selected strategies from a list provided by the experimenter rather than actually composing message. He found under this condition, the effect of the desire for liking disappeared. Based on that, he argued that message construction, which gives people more freedom to choose, may be the more useful approach in determining effects of situational variables on the selection of communicative strategies.

Reviewing Noelle-Neumann’s elaboration on the spiral of silence theory, we can find one study that tried to address this point. Her threat test (smoking in the presence of nonsmokers, 1976) did suggest an alternative way of “remaining silent.” In that study,
she attempted to simulate the dangers of social isolation in a field experiment. For the first time, she used a picture with a sentence-completion test in an interview with smokers to simulate the reality of being intimidated by a strong contrary opinion. The second experiment asked the smokers to complete the sentence that has been started, which she claims leads to experiencing the situation more intensely. Afterwards, the result showed that the verbal threat influenced the tendency to speak out or remain silent. After being threatened verbally, smokers who had defended their right to smoke in the presence of nonsmokers showed noticeably less interest in taking part in a discussion on this topic in a train compartment (p. 44).

This study shows that when the smokers felt the opinion climate on smoking was unfavorable to them, they tended to avoid talking about the issue of smoking in public. This suggests that topic selection can also be an example of people’s choice of speaking up or remaining silent. Therefore, we can logically propose that in a small group conversation, given a variety of topics, if people sense the opinion climate on a certain issue is unfavorable to them, they will consider that particular issue as dangerous and will try to avoid discussing it. Here dangerous means the activity of bringing up that issue in the discussion involves higher degree of estimated risk of imposition, which has a negative effect on the self-presentation.

Goffman (2001) argued that self is a product of performance in social interaction and it is shaped in the process of self-presentation. In his view, interaction is fraught with a host of possible threats and failings. As a person acts, others may give what he calls the "worst possible reading" of his acts (Goffman, 1990). Following this logic, the participants may worry that the act of bringing up the controversial issue in the discussion
can receive the “worst possible reading,” which will definitely affect their self-presentation. Therefore instead of bringing that risk, they may initiate the conversation by talking about other safer topics and leave that dangerous issue to last or not even mention it at all during the whole conversation. What is important to note here is that it is not simply expression of opinions that may be avoided - discussion of whole topics may be avoided, not just opinion expression on those topics.
CHAPTER 3

COMPUTER MEDIATED COMMUNICATION

Being aware of the limitations of previous spiral of silence research, we try to test this theory from a new perspective -- observing discussion in a CMC context. In prior studies, the role of mass media and FTF interaction in public opinion formation and expression was widely discussed. Meanwhile, the relation between the new media and its moderating effect on people’s opinion expression has been relatively ignored. The emergence of CMC provides a new context to test the spiral of silence theory. So far few such empirical studies have been undertaken.

CMC is an emerging topic in communication research. It raises the possibility of revolutionary social and structural changes in the ways people communicate and relate to each other (Hiltz & Turoff, 1992; Sproull & Kiesler, 1991; Tan, Wei, Watson & Walczuch, 1998), thus it may challenge existing theories and models. Is the spiral of silence model applicable in a CMC context? In other words, if the discussion context is changed from FTF to CMC, will the spiral effect be less likely? A clearer picture of the relationship between communication context and minority opinion expression, and a more solid understanding of the influence of spiral effects under anonymous circumstances, needs to be explored.
Some empirical studies on CMC support the need for re-examination of the spiral of silence in a new communication context. Noelle-Neumann (1984) cited the literature on group dynamics and also raised Asch's (1951, 1952) famous length-of-line experiments as evidence that fear of isolation exists. Based on the methods of Asch's experiment, but this time in a CMC context, Smilowitz, Compton and Flint (1988) conducted a study on how the exclusion of contextual cues (e.g., social status, gender, and nonverbal communication) typically provided by FTF interaction influences individual judgments in CMC. After putting the participants in a computerized version of the classic procedures of Asch's (1956) "majority against a minority of one" investigation, they found that CMC is likely to diminish the effects of social pressures to conform to majority judgments. In the CMC environment, people may be more critical of and more willing to evaluate the information they are receiving. This not only directly challenges Asch's social conformity experiment, but also indicates that changing the communication context from FTF interaction to CMC can produce findings that are contradictory to previous results obtained from studies conducted in the past.

Furthermore, research on the importance of reference groups (which provide support) and target audiences (toward whom expression is directed) suggest the possibility of observing a different spiral effect in CMC than in FTF. Hayes, Shanahan and Glynn (2000) observed a much larger relationship (.09) between people's willingness to speak their opinions and the perceived support for that opinion. This relationship was bigger than the average correlation (.03) reported in their meta-analysis on the spiral of silence. They pointed out that one of the factors responsible for the discrepancy is the inconsistency between reference groups and target audience, that is, mixing the reference
group and the target audience (e.g. measuring support for own opinions in the media and willingness to express to a group of people at a dinner party), as previous researchers often did. This inconsistency does not provide enough correspondence in measurement, which may account for the difference they observe. Based on these arguments, we can logically suggest that the extent to which people know the audiences to whom they are talking will influence their willingness to speak up.

Therefore, testing the spiral of silence theory in CMC provides a new context to test the theory, and it may challenge the spiral of silence theory. First, CMC often has the characteristic of anonymity, which is one of the biggest differences from FTF interaction. In the CMC context, people often do not know to whom they are speaking; that is, they may have no idea who their target audience is. Moreover, these target audiences may be widely geographically dispersed. Thus, it is natural to question the power of fear of isolation in CMC. Although the online community can be regarded as one kind of social organization, is the fear of social isolation presented equally as in FTF, which will increase the pressure for people to conform?

Postmes, Spears and Lea (1998) pointed out that in the CMC context, the situational norm is a norm that is specific to the group in the study or to the experimental context. CMC may provide a computing subculture in which “flaming” is seen as good and desirable, whereas this behavior would be seen as rude and undesirable outside of that group. In CMC, the “flaming” effect demonstrates the violation of the general expectation for politeness that is universally regarded.
Inconsistent Findings in CMC

In order to further explore this question, the empirical studies already conducted about minority opinion expression in CMC should be examined. Although most of the empirical research deals with group decision-making or problem solving in CMC, they offer relevant information about using CMC for minority political opinion expression, including the relative participation of group members and information exchange on CMC. Unfortunately, the findings reveal some inconsistency.

Due to the lack of social cues CMC environment, researchers argued that CMC was impersonal and online communicators would become disinhibited and hostile (Kiesler, 1986). This prediction was supported by the later research; compared with people in FTF, CMC communicators were found to express greater hostility and convey more socially-undesirable message (commonly labeled as “flaming.”)

McLeod, Saron, Marti and Yoon (1997) indicated that minority opinion holders expressed their arguments most frequently under anonymous CMC by comparison to FTF. Some studies echoed that member participation is distributed more equally in CMC than in FTF (Dubrovsky, Kiesler, & Sethna 1991; Huber, 1994; Kiesler, Siegel, & McGuire, 1984). Kiesler et al. (1984) compared participation of three-member FTF and CMC groups trying to reach consensus on an ethical dilemma. They found both types of groups tended to have one member dominate the conversation, but the dominance was significantly less pronounced in CMC groups. After conducting a CMC focus group study, Walston and Lissitz (2000) suggested that CMC does not eliminate the problem of domination but can lessen it.
This equalization perspective was challenged by the findings of other researchers (e.g., Lea, O’Shea, Fung, & Spears, 1992; Postmes, Spears, & Lea, 1998, 2000; Spears & Lea, 1994; Walther, Anderson, & Park, 1994; Weisband, Schneider & Connolly, 1995; Weldon & Mustari, 1988). Weisband and his colleagues (1995) conducted a small “mixed status” groups working on ethical dilemma decision tasks. They found that high status members (MBA students) participated more than the low status members (undergraduate students) in both CMC and FTF sessions, even when status was not apparent to the other members. Besides that, Postmes et al., (1998, 2000) compared the group influence between CMC and FTF. They found that when communicators share a common social identity, they appear to be more susceptible to group influence in CMC. Based on their findings, they argued that CMC may have a dual-function---it may not only provide people the opportunity to traverse social boundaries, but also afford these boundaries greater power. Their research demonstrates the important influence of group norms in determining social identity and self-categorization in anonymous CMC environment. All these inconsistent findings suggest the relation between communication context and minority opinion expression is still unclear.

In order to better understand the extant literature, we should explore why the researchers report inconsistent results. Of the experimental studies conducted, there are myriad dependent variables, conditions, participant pools, and study features which have made it difficult to interpret the large number of findings in recent research, especially when at first glance the findings appear to be inconsistent.
Bordia (1997) suggested in his review of the literature that some of the differences across studies might help explain some of the contradictions and inconsistencies in the findings. Those differences include differences in the nature of group task, the sample examined (e.g., students vs. managers), the time allotted to complete tasks, the type of CMC (synchronous vs. asynchronous), participants status (same vs. differential), the assessment of the group's performance (objective vs. subjective ratings), and also the degree of anonymity (Baltes, Kickson, Sherman, Bauer & LaGanke, 2002).

Besides that, a meta-analysis of CMC and group decision making conducted by Baltes et al. (2002) raised another important point in explaining the occurrence of these inconsistencies. They argued that this may be partly due to the fact that some studies have been conducted to evaluate the effectiveness of Group Decision Support Systems (GDSS), systems specifically designed and marketed as decision support tools for organizational use. These systems differ from traditional online chat systems in that they commonly incorporate features such as highly structured interactions, voting tools, and group facilitators. Other studies were conducted in chat systems, which are more realistic and contain mostly natural information exchange. These unique factors in GDSS reinforce some characteristics of FTF interaction, which are absent in typical chat systems. Therefore, it is not surprising to find different outcomes in the GDSS studies compared to other CMC research.
The Influence of Anonymity in CMC

After reviewing the CMC literature and examining the function of anonymity, one crucial question arises: Will anonymity exert an influence on people’s opinion expression, thus eliminating the effect of fear of isolation and thereby contradicting the spiral of silence theory? If the use of CMC fundamentally changes group dynamics, upon which Noelle-Neumann built her theory, this suggests that we should re-examine the spiral of silence model.

Previous research shows that social presence in different communication contexts may facilitate awareness of and relationships among people (Rice, 1987; Short, Williams, & Christie, 1976). There have been attempts to use social presence theory to explain the different communication patterns in FTF and CMC (Hiltz et al., 1986). CMC rates extremely low in social presence (Rice, 1984). Anonymity is regarded as a structural feature of the medium, which may influence opinion expression in CMC.

Spears and Lea (1994) summarizes four contextual features that distinguish group tasks in CMC from FTF environments. They are anonymity (undisclosed identity among same-group members), isolation (spatial separation), identifiability (presence of in-group and out-group), and co-presence (knowledge of presence of other groups).

An important aspect of the extant literature is the effect of anonymity on CMC. Anonymity is an important variable in the study of group behavior and a vital component of much social-scientific research (Scott, 1999). In defining anonymity, Dennis (1996) regarded it as a feature of many text-based CMC systems that allow group members to contribute to discussions without attaching their names, potentially motivating them to participate differently.
Spears and Lea (1994) provided a model based on social identity and de-individuation (SIDE), incorporating aspects of de-individuation (Reicher, 1984, 1987) to explain effects of anonymity and isolation within CMC (Kahai, Avolio, & Sosik, 1998). The SIDE model proposed that anonymity in a group reduced self-awareness and identity (Zimbardo, 1969) ("I don’t know about myself or who I am without others as referents"). When participants lack a salient social identity, they will experience the isolation of CMC in a way that may reduce their acceptance of the power of the group to influence their behaviors (George & Sleeth, 2000).

The GDSS anonymity research reveals that group members generate more solution clarifications, critical comments, questions about the solution, and more total comments when anonymous, as opposed to being identified (Jessup, Connolly, & Galegher, 1990). Individuals working under anonymous conditions generate more total and critical comments than members in either visible or identified conditions (Jessup, Tansik, & Laese, 1988). Anonymity of the self to others (i.e., lack of indentifiability) allows the person to express his/her true mind, or authentic self, unfettered by concerns of self-presentation (Spears & Lea, 1994), and might lead to a reduction in conformity to group norms. From these studies, we can observe the positive impact of anonymity in member participation in CMC.

Studies show that thoughts and ideas expressed under conditions of anonymity are more likely to be evaluated based on their merit rather than on the status of the person presenting the information (Jessup, Connolly, & Gelegher, 1990; Zigurs, Poole, & DeSanctis, 1988). Scott (1999) argued that anonymity may serve to free individuals from social evaluation and scrutiny, allow for free expression of ideas, and focus attention on
ideas rather than on the status of their advocates. This has been echoed by many other investigators (e.g., Dubrovsky et al., 1991; Hiltz et al., 1986; McGuire et al., 1987; Siegel et al., 1986; Weisband, 1992) by indicating that CMC causes status differentiation to be less salient and thus yields greater participation from all. The implication is that CMC leads to enhanced communication openness (O’Reilly & Roberts, 1977), which is encouraging, or at least permitting, the open expression of views divergent from others. This is important because the expression of minority opinion is the key dependent variable in the spiral of silence.

However, researchers also found that communication openness is not necessarily increased in all CMC conditions. For instance, when CMC group members’ contribution is not anonymous, CMC group performance is significantly worse than FTF group performance. Based on that, Baltes et al. (2002) suggested differential influence of CMC on information senders and receivers. They argued that there may be a difference between the willingness on the part of group members to express opinions that are incongruent with those of other members and the willingness of group members to hear others’ incongruent opinions. The CMC condition may enhance the former, but it does not necessarily enhance the latter. Therefore this suggests that the minority may express opinions more often in the CMC context than in FTF interaction, but whether or not these opinions are actively received and processed is questionable.

Furthermore, anonymity may exert an influence on people’s evaluation of threat of isolation. Olaniran (1994) conducted research to analyze the influence of anonymity on CMC groups. He found that anonymity allows members to offer ideas that may be in conflict with the others without feeling the threat of being evaluated.
A review of the literature suggests that anonymity decreases conformity pressure (Nunamaker, Dennis, Valacich, Vogel, & George, 1991; Valacich, Fessup, Dennis, & Nunamaker, 1992) and allows individual group members to be less inhibited in their expression of ideas (El-Shinnaway & Vinze, 1997). Thus, potentially more equitable participation may be observed (Balte et al., 2002).

Embarrassment may be used to explain the equalization effect. Derived from Goffman’s ideas on self, Gross and Stone (1970) pointed out that embarrassment is deliberately perpetrated as a negative sanction as in “calling” the one who is giving an undesirable performance and therefore incapacitates the person from performing his role. Since contributions are often anonymous in CMC, there is also less risk of embarrassment when making comments that might be interpreted by other participants as worthless or ignorant (Balte et al., 2002). This attribute of CMC is closely related to the important component of the spiral of silence theory, because embarrassment is also an expression of fear of isolation (Hallemann, 1986, 1989, as cited by Noelle-Neumann, 1991), and fear of isolation is an assumption of the theory. The embarrassment experiment was replicated in various countries including Germany, Spain, and Japan, and the common existence of embarrassment was observed. Furthermore, Hallemann investigated the tendency of persons with high and low scores on sense of embarrassment to speak up or keep silent, and found that individuals with a stronger sense of embarrassment also had a stronger tendency to remain silent in conversations about controversial topics. Therefore embarrassment, and accordingly the fear of isolation here, can serve as bridge in the relationship between anonymity and opinion expression.
Being aware of the limitations of prior studies on the spiral of silence, we conducted an experiment in which participants were placed in a real conversational situation (although somewhat artificial) instead of a merely hypothetical one. In our study, a real-time online or FTF discussion was created and people were actually able to “talk” while being recorded. This improved upon the traditional hypothetical situation in most spiral of silence research. Furthermore, we manipulated a moderating variable -- communication context (FTF vs. CMC). Since minority opinion expression is the indicator of whether the spiral effect exists or not, one unique advantage of this experiment was that it can directly and explicitly measure minority opinion expression by analyzing the transcript of the discussion, instead of relying on the self-report of the participants to measure their willingness to express in a hypothetical situation. Furthermore, the communication activity in this study was an informal discussion about local issues. It put the participants in a group conversation setting instead of a dyad as in the train test. It also provided the flexibility for the participants to choose topics for their discussion, instead of focusing on a single issue for discussion.
CHAPTER 4

HYPOTHESES

The literature on CMC indicates that anonymity may decrease the fear of isolation and social conformity pressure and allow individuals to be less inhibited during group interaction. Considering the nature of the communication context itself, we would expect differences in behaviors between anonymous CMC and non-anonymous FTF discussion groups. Therefore, we offer the following hypothesis:

H1: People's fear of isolation is related to the communication context such that participants in CMC will express less fear of isolation than those in FTF.

The relative priority or ranking of issues in the discussion may be a strategic way of managing self-presentation, which is one of the primary communicative moves this thesis hangs on. O'Keefe and Delia's (1982) listener-adaptation model of communicative development substantiates this argument. In this model, they adopted a hierarchical coding approach to the analysis of messages. The hierarchical systems ordered the strategies along various dimensions reflecting the extent to which the strategies themselves imply sensitivity to the perspectives of message recipients. They also employed a parallel hierarchical coding approach to the analysis of message producers' rationales for their message choices.
Applying that notion to this study, we argue that the new means of conceptualizing and operationalizing "speaking out" and "remaining silent" suggests that when people are given the opportunity to choose the topics for initiating or maintaining the conversation, they may have a hierarchical ranking in their mind, which is determined by how controversial the topics are. Besides the actual minority opinion expression itself, topic selection and the order of the controversial issue being raised in the conversation are both important indicators of "speaking out." When people perceive they are the minority on a particular controversial issue in the group, they probably choose not to raise that topic during the conversation. If that issue has been brought in by other discussion partners, what they probably do is choose not to voice their opinion on it. If people run out of the topics during the discussion and the minority realize that they can not avoiding addressing that controversial issue on which they are in the minority, they may leave that issue on the bottom of the priority and talk about it as the last topic. In summary, fear of isolation and perceived minority status in the group may have an impact on the topic selection and the order of the controversial issue discussed in the conversation, as well as on the actual minority opinion expression on a value-laden issue. Given a variety of topics to discuss, the participants in FTF and in CMC may engage in different behavior.

Drawing upon all the scholarship already discussed, the following predictions were made for the informal discussion about local issues:

H2a: The effect of fear of isolation on minority opinion expression will be greater for participants in FTF than those in CMC.
H2b: The effect of fear of isolation on controversial (death penalty) topic selection in the discussion will be greater for participants in FTF than those in CMC.

H2c: The effect of fear of isolation on the order of the controversial issue (death penalty) being discussed in the conversation will be greater for participants in FTF than those in CMC.

H3a: The effect of minority status on minority opinion expression will be greater for those in FTF than in CMC. That is, feeling they are in the minority status, participants in CMC will be more willing to express their opinion than those in FTF.

H3b: The effect of minority status on controversial topic selection in the discussion will be greater for participants in FTF than those in CMC. That is, feeling they are in minority status, participants in CMC will be more likely to talk about controversial issue than those in FTF.

H3c: The effect of minority status on the order of controversial issue being discussed in the conversation will be greater for participants in FTF than those in CMC. That is, feeling they are in minority status, participants in CMC will more likely to talk about controversial issues early in the conversation than those in FTF.
CHAPTER 5

METHOD

Participants

Participants in the experiment were 155 adults (83 female, 72 male) living in the Columbus area who were recruited by a temporary employment agency, 33 staff (18 female, 15 male) of the Ohio State University recruited by experimenter’s email invitation, and 42 OSU undergraduate students (24 female, 17 male) recruited in class by the experimenter. Adults and staff were awarded fifty dollars and undergraduates were awarded course credit for their participation.

Women comprised 54.8% of the sample and men 45.2%. 52.9% identified themselves as Caucasian/White; 38.8% as African-American; 6.6% as others; 2.2% as Hispanic; and 1.3% as Asian-American. 29.1% of the sample had some college education; 21.7% were college graduates; 20.9% were high school graduates; 17.8% had a business or trade school education; 7.4% had a graduate school education; 2.6% had some high school education; the remaining 0.4% had completed grade school or less.

The mean age of this sample was 31 years (SD = 11.67, N = 227), and age ranged from 17 to 67. Respondents with household incomes between $10,000 and $19,999 comprised 27.1% of the sample, and those with incomes between $20,000 and $29,999 made up 20.9%, whereas those with incomes between $30,000 and $39,999 made up 7.6%, and
those with income below $10,000 comprised 19.6% of the sample; and those with income ranged from $40,000 to $80,000 made up 17.3% of the sample; and those with income above $80,000 comprised 7.6% of the sample.

Design

The study was a 2 (discussion vs. not) x 2 (CMC vs. FTF discussion) between subjects experimental design. There were other manipulations in the experiment such as exposure to news and notification that a discussion would take place. But when we tested the simple effects of those manipulations on the dependent variables, they were not significant. The difference on minority opinion expression between those who were exposed to news (M = .10, SD = .31, N = 39) and who weren’t (M = .16, SD = .37, N = 25) was non-significant (p = .51). The difference on topic selection between exposure group (M = .16, SD = .37, N = 104) and no-exposure group (M = .20, SD = .40, N = 50) was not significant, either (p = .58). The difference on minority opinion expression between those who were notified a future discussion (M = .10, SD = .30, N = 20) and who weren’t (M = .14, SD = .35, N = 44) was non-significant (p = .69). The difference on topic selection between notification group (M = .19, SD = .40, N = 52) and no-notification group (M = .17, SD = .34, N = 102) was not significant, either (p = .70).

Therefore, there was no reason to expect those manipulations to influence the outcomes.

There were two measured independent variables in this study: fear of isolation and perceived minority status. Three dependent variables were: minority opinion expression, topic selection (whether or not a controversial topic was discussed, in this
study, it is the death penalty), and the order the controversial issue was raised in the
discussion. The communication context (CMC vs. FTF) served as a manipulated
moderating variable.

**Materials**

The experimenters created a web site modeled after the online version of the
*Columbus (OH) Dispatch*, to which only some of the subjects were exposed for 20
minutes prior to the discussion. The Web site contained six categories of local news
selected from the archive of the *Columbus Dispatch* in the months before the study. The
six categories of local news were: crime, urban growth, transportation, taxes, education
and economy. Each category contained five news articles. The crime section also
included a letter to the editor titled “Death Penalty: Pro or Protest,” written by the
experimenter with a pseudonym. The letter explicitly expressed support for death penalty,
which is the majority position according to national public opinion polls (Gallup Press
Release, 2003)\(^1\), but in doing so presented arguments on both sides of this issue. The
order of the six categories of local news in the experimental site was randomized across
participants.

The death penalty was the only issue addressed in an opinion article. A separate
survey of 229 undergraduate students was conducted to examine the moral component of
the seven issues in the study (the death penalty was treated as a separate issue from
crime) and how controversial these issues were perceived to be (See Appendix A for the
exact wording of the survey). The top two issues that have the highest mean score on

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\(^1\) Gallup's latest update (May, 2003) on the death penalty shows a continued high level of public support for
the death penalty for those convicted of murder. The poll, conducted May 5-7, finds 74% of Americans in
favor of and 24% opposed to the "death penalty for a person convicted of murder."
moral component were the death penalty (M = 6.31, SD = 1.15, N = 228) and crime (M = 5.5, SD = 1.53, N = 229). Then a one sample t-test was conducted to see whether the mean score of the death penalty on moral component was significantly higher than crime. The results showed that it was the case (p < .0005). The same strategy was used to find the most sensitive issue (also see Appendix A for exact wording). Results showed that the mean score of the death penalty on sensitivity was the highest (M = 6.06, SD = 1.38, N = 229), followed by crime (M = 4.71, SD = 1.62, N = 229). The one sample t test indicated that the mean score of the death penalty on sensitivity was statistically significant higher than crime (p < .0005). Based on these results, we concluded that the death penalty was the most controversial issue in the study.

Procedure

Each session of the experiment accommodated 9 to 15 people. All participants were randomly assigned to conditions. All participants began by completing a short pre-test questionnaire. For those exposed to the news Web site, only a subset were informed in advance that they would be expected to discuss what they read with a group of people at some point after exposure (see exact instructions in Appendix B). The remainder did not receive the future discussion notification. All participants were informed not to talk with each other during the experiment without the instruction from the experimenters.

After 20 minutes of exposure elapsed, the exposure ended and the experimenters started to move people in random order and one by one, to one of two discussion conditions (FTF vs. CMC). Each of the CMC participants was placed alone in a small computer room, without knowing who else was in the same CMC chat room. Once in the room, they were quickly trained how to use the chat program, and told to login in by
pseudonym (e.g. “User 3”). They started discussion after receiving instructions from the chat moderator telling them to seek, share information or express opinion in the discussion by talking about issues related to the Columbus area (see Appendix B). The online chat transcripts were automatically saved by the Web server.

Those in the FTF discussion setting were all seated around the table in a room during the whole FTF discussion. They received the same instructions for the discussion as those given to the CMC participants. The discussions were video and audiotape recorded by a moderator and later transcribed. The recording equipment was visible to all participants.

Discussions in both conditions lasted 20 minutes. During this period of time, the moderator only intervened if it became necessary to remind participants to discuss issues important to Columbus area, and this only occurred when the discussion deviated from the predetermined topics. There were 20 FTF and 20 CMC discussions over the course of the study, with group sizes of three to five subjects per discussion group. Each discussion group included some people who had been given exposure to news context and some who had not.

Measures

Fear of Isolation

After the discussion ended, all participants completed a series of questionnaires. Among these questions were 5-point Likert (1: strongly disagree; 2: disagree; 3: feel neutral; 4: agree; 5: strongly agree) questions designed to tap fear of isolation (see Appendix C). This measure is made by combining the questions used by Moy et al., (1999) and Scheufele et al., (2001) in their study of the spiral of silence.
For the 6-item scale of fear of isolation used in this study, three items are worded to measure “fear” (e.g. I don’t tell other people my opinion when there’s a risk they’ll avoid me because of it.); while the rest three items are worded in an opposite way to measure “fear” (e.g. I don’t worry about other people avoiding me.”) These three items in the second category were recoded to be consistent with the first category.

The mean score on item 1 “I don’t tell other people my opinion when there’s a risk they’ll avoid me because of it.” was 2.3 (SD = .94, N = 228). The mean score on item 2 “I try to avoid getting into arguments.” was 3.6 (SD = 1.07, N= 228). Item 3 “Arguing over controversial issues improves my understanding of those issues.” is worded as the opposite way of measuring fear. This item was recoded and the mean score for this item was 2.6 (SD = 1.08, N = 228). Item 4 “I don’t worry about other people avoiding me.” was also recoded and the mean score was 2.4 (SD = .98, N= 228). Item 5 “I enjoy a good argument about a controversial issue.” was recoded and the mean score was 2.6 (SD = 1.15, N = 228). On item 6 “I worry about being isolated if people disagree with me.” the mean score was 2.1 (SD = .88, N = 228). The reliability of this 6-item scale of fear of isolation measure is a little bit lower than what Scheufele reported (alpha = .64).

The fear of isolation was calculated in two levels. One is the individual level fear of isolation, which is obtained by calculating the measure score of the individual on the six items. Result showed that individual level fear of isolation was normally distributed with a mean score 2.62, (SD = .61, N = 228). The group level fear of isolation was
obtained by calculating the mean score of individual level fear of isolation of all the participants' in each discussion group. Result showed that group level fear of isolation was normally distributed with a mean score 2.59 (SD = .30, N = 40).

*Perceived Minority Status*

Questions also probed personal opinions and perception of other discussion participants' opinions on the death penalty (see Appendix C). Minority status was tapped in two ways. One is the current perceived minority status in the discussion group; the other is the future trend of discussion group opinion. The former was identified by examining the answers of question 1 and 2, while the latter was determined by looking at the answers of question 1 and 3 (see Appendix C). Those participants who indicated an inconsistency between personal opinion and the perceived majority opinion in the discussion group were defined as minority in the discussion group. For example, if the participant favored the death penalty but s/he reported that a majority in his/her discussion group opposed the death penalty (either s/he perceived a majority oppose the death penalty in the discussion group or s/he perceived the opinions are changing toward them opposing the death penalty), the participant will be identified as perceiving him or herself as a minority in the group. For those who perceive themselves as minority, we assigned value 3 to them. For those who perceive themselves as majority, we assigned value 1 to them. For those who perceive the opinion climate on death penalty is evenly split, we assigned value 2 to them. We test the effect of minority status (current and future trend) on the minority opinion expression respectively.
For current perceived minority status, 20.1% perceived they were minority, 22.4% perceived they were majority, while the remaining 57.5% perceived the attitudes toward the death penalty are split evenly between those who favor and those who oppose. The mean score for current minority status was 1.98 (SD = .65, N = 134). For perceived minority status for future, 20.6% perceived they would be minority, 8.8% perceived they would be majority, while the remaining 70.6% perceived the attitudes toward the death penalty would be split evenly between those who favor and those who oppose. The mean score for current minority status was 1.88 (SD = .53, N = 136).

Coding

Minority Opinion Expression

For hypotheses H2a, H2b, H3a, H3b and H3c, the unit of analysis was individual. For hypothesis H2c, the unit of analysis was discussion group. All the FTF discussions were transcribed and put into the same visual format as the CMC transcripts by the experimenters. The discussion transcripts were printed out and coded one by one.

First, we broke up transcripts into "utterances" and coded each utterance separately. Theoretically an utterance is defined as "the linguistically meaningful message that a person speaks during conversation" (Nofsinger, 1991). Levinson (1983) pointed out that "an utterance is the issuance of a sentence, a sentence-analogue, or sentence-fragment, in an actual context." (p.18). On average, a FTF discussion has 605 utterances (SD = 109, N = 20), and a CMC discussion has 120 utterances (SD = 31, N = 20). The average number of utterances expressed by an individual was 159 (SD = 96, N = 76) in FTF discussion, and 31 in CMC discussion (SD = 15, N = 78).
Second, we located all the utterances about the death penalty in the transcripts, and gave the value 3 to all utterances under the topic of the death penalty (for code for other topics of utterance, please see Appendix D).

Third, we classified the utterances into one of six categories, which derived from Searle’s (1990) theory on illocutionary acts. The categories are: 1. Assertion of Fact (e.g. In the letter to the editor, the author supported the death penalty), 2. Request for Fact (e.g. Did you read the story on the high school drop out in Columbus public school?”), 3. Request for Opinion (e.g. What do you think of the death penalty?) 4. Assertion of Opinion (e.g. I hate the death penalty.) 5. Other (e.g. I see.) 6. Could Not Code (which is for any murmur or unheard utterances). All incomplete utterances or indefinable utterances were put into this category (also see Appendix D for coding rules).

In this study, a minority opinion expression does not mean any opinion expression by a member of the minority. That is, a member of the majority can engage in minority opinion expression. Therefore, minority opinion expression on the topic of the death penalty was identified as opinion expression that was not consistent with the perceived majority opinion in the discussion group. For instance, if a person perceived the majority in the group favored the death penalty, then all the opinion expression by that person opposing the death penalty were coded as minority opinion expression.

After counting in the discussion transcripts the total number of the utterances on the death penalty opinion expression by that person, we dichotomized the minority opinion expression into two categories (0 = never express minority opinion, 1 = any expression of minority opinion). The reasons for dichotomizing this variable are based on both the theoretical and methodological considerations. Noelle-Neumann (1991) pointed
out in her spiral of silence theory that this theory examined any minority opinion expression, not how often a person expressed a minority opinion. In this sense, an individual’s choice to utter one minority opinion is no different from uttering many minority opinions on the controversial issue. For the methodological concern, the choice of dichotomizing this variable was made based on the fact that the distribution of the minority opinion expression is highly skewed, as results showed that the majority of the participants, 87.5%, did not express any minority opinion on the death penalty, only 12.5% of the participants did. The mean score is .13 (SD = .33, N = 64\(^2\)).

**Topic Selection**

In this study, the topic is defined as the particular issue being discussed in the conversation, which contains ten categories: the death penalty, crime, urban growth, transportation, taxes, education, economy, task-oriented, others, and unclear/could not code. (For detailed description of the coding for topic of utterance, please refer to Appendix D). We coded which topics have been discussed in the conversation by a given individual. Then, a variable “topic selection” was constructed with 1 equal to talking about the death penalty and 0 equal to not talking about the death penalty. That is, we dichotomized the topic selection into two categories: discussion about the death penalty and discussion not about the death penalty. The result showed that the majority of the participants, 82.5%, did not talk about the death penalty. Only 17.5% did. The mean score is 0.18 (SD = .38, N = 154).

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\(^2\)This sample size N = 64 came up by excluding individuals who perceived the opinion climate was evenly split, since those individuals could not be regarded either as the majority nor as the minority, that is, they could not express minority opinion.
Order of the Death Penalty Being Discussed

Then, we further coded the order of the death penalty being discussed in the whole conversation. For this variable, we constructed it at two levels--- group level and individual level. For order of the death penalty being discussed (group level), the unit of analysis was the discussion group. Order was the place in the discussion where the death penalty was brought up, which was operationalized as the ratio of the number of the first death penalty utterance coming up in the whole discussion to the total number of utterances in that particular discussion. For those discussions that did not talk about the death penalty at all, the score for this variable was one. The mean score we got was .87 (SD = .30, N = 40). Low values on this variable represented mentioning the death penalty early in the discussion, and the high values reflected talking about the death penalty late in the discussion, and value 1 meant this discussion group never brought up the issue of death penalty at all. With the increasing of the value in this variable, it indicated an increasing trend of unwillingness to bring up the death penalty.

For order of the death penalty being discussed (individual level), the unit of analysis was the individual. Order was the place in the discussion where the death penalty was first brought up by the individual, which was operationalized as the ratio of the number of the first death penalty utterance coming from an individual to the last utterance made by that particular individual in the whole discussion. The range of this variable was from 0 to .94. For those individuals who did not talk about the death penalty at all, the score for this variable was one. The mean score we got was .91 (SD = .24, N =154). Low values on this variable represented the individual mentioning the death penalty early in the discussion, and the high values reflected that individual talking about the death
penalty late in the discussion, and value 1 meant this individual never brought up the issue of death penalty at all. With the increasing of the value in this variable, it indicated an increasing trend of unwillingness of the individual to bring up the death penalty.

**Intercoder Reliability**

We conducted a two-stage reliability assessment. One is reliability for unitization; the other is reliability for classification. The speaker turn is chosen as the unit for reliability assessment. We randomly selected five pages of conversation transcript (about 100 speaker turns) and two independent coders evaluated those speaker turns to assess intercoder reliability. Coders broke every speaker turn by utterances and counted the total number of utterances in a speaker turn (for the detailed description of the unitization of coding, please see Appendix E). Krippendorff's alpha was .90 for unitizing.

For categorization coding, coders classified each utterance into various categories. For topic categorization, Krippendorff’s alpha was .92; and for utterance classification, it was .75.
Hypothesis 1 predicted that people in CMC will express less fear of isolation than those in FTF. Independent sample t-test was used to test it. The result (as shown in Table 6.1) did not support this prediction. People in FTF group have a mean score 2.64 of fear of isolation (SD = .62) and people in CMC group have a mean score 2.56 of fear of isolation (SD = .59, N = 77). Although the people in CMC groups appear to feel less fear of isolation in the discussion than those in FTF, the difference between FTF and CMC groups is not significant ($t = .835, p = .405, N = 152$).

<table>
<thead>
<tr>
<th>Communication Context</th>
<th>FTF</th>
<th>CMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of isolation ($df = 150$)</td>
<td>2.64</td>
<td>.62</td>
</tr>
</tbody>
</table>

*Note.* Significance test is based on the actual number of case in each group. Higher mean indicate higher fear of isolation in the discussion. Differences between FTF and CMC groups are not significant ($p = .405$) The sample size $N = 153$.

Table 6.1: T-Test Showing No Significant Difference on Fear of Isolation between People in FTF and in CMC
For all following below tables, the total number of utterances was controlled in the analysis, depending on whether the total number of utterances of individual or the total number of utterances of the discussion was used in the hypothesis. The reason for doing that was individuals in FTF had lots more utterances in FTF than in CMC. The average number of utterances expressed by an individual was 159 in FTF discussion, and 31 in CMC discussion. Accordingly, FTF discussions had lots more utterances than CMC discussions. On average, a FTF discussion has 605 utterances, and a CMC discussion has 120 utterances. Based on that, there were more chances for people to express minority opinion in FTF. Therefore we controlled for the total number of utterances in the analysis.

For H2a, H2b, H3a, H3b, the dependent variables “minority opinion expression” and “topic selection” were dichotomized, and logistic regression was used to test them.
Table 6.2: Logistic Regression (Binary) For Effect of Fear of Isolation on Minority Opinion Expression in Different Communication Context (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of isolation</td>
<td>.002</td>
<td>1.013</td>
<td>.998</td>
<td>1.002</td>
</tr>
<tr>
<td>Communication context</td>
<td>.886</td>
<td>3.440</td>
<td>.797</td>
<td>2.427</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.002</td>
<td>.005</td>
<td>.677</td>
<td>.998</td>
</tr>
<tr>
<td>Interaction (fear of isolation*communication context)</td>
<td>-.075</td>
<td>1.291</td>
<td>.954</td>
<td>.928</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.130</td>
<td>2.615</td>
<td>.415</td>
<td>.119</td>
</tr>
</tbody>
</table>

Note: The sample size N = 64.

Table 6.3: Logistic Regression (Binary) For Effect of Fear of Isolation on Minority Opinion Expression in Different Communication Context (Main Effect)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of isolation</td>
<td>-.044</td>
<td>.630</td>
<td>.944</td>
<td>.957</td>
</tr>
<tr>
<td>Communication context</td>
<td>.695</td>
<td>.969</td>
<td>.473</td>
<td>2.004</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.002</td>
<td>.005</td>
<td>.677</td>
<td>.998</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.015</td>
<td>1.701</td>
<td>.236</td>
<td>.133</td>
</tr>
</tbody>
</table>

Note: The sample size N = 64.
Hypothesis 2a proposed that in CMC, minority will speak up more than those in FTF. As shown in Table 6.2 and Table 6.3, the results did not support H2a. We did not detect any significant main effect or interaction in this hypothesis testing. H2a proposed there was an interaction between fear of isolation and communication context on influencing the minority opinion expression. Therefore we tested the interaction in the logistic regression, and found it was not significant ($p = .954$). That is, there was no interaction between fear of isolation and communication context in influencing the minority opinion expression. Thus, we ignored the interaction and examined the main effects in the model. The results in Table 6.3 showed no significant findings of the main effects, either. The main effect of the fear of isolation on minority opinion expression was not statistically significant between FTF and CMC ($p = .944$). Neither the main effect of the communication context ($p = .473$) nor the main effect of total number of utterances of the individual ($p = .677$) on minority opinion expression was statistically significant.
### Table 6.4: Logistic Regression (Binary) For the Effect of Fear of Isolation on Topic Selection In Different Communication Context (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of isolation</td>
<td>.774</td>
<td>.823</td>
<td>.347</td>
<td>2.169</td>
</tr>
<tr>
<td>Communication context</td>
<td>5.346</td>
<td>2.636</td>
<td>.043</td>
<td>209.669</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>.000</td>
<td>.003</td>
<td>.903</td>
<td>1.000</td>
</tr>
<tr>
<td>Interaction (fear of isolation*communication context)</td>
<td>-1.331</td>
<td>.931</td>
<td>.153</td>
<td>.264</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.726</td>
<td>2.340</td>
<td>.043</td>
<td>.009</td>
</tr>
</tbody>
</table>

*Note.* The sample size $N = 152$.

### Table 6.5: Logistic Regression (Binary) For the Effect of Fear of Isolation on Topic Selection In Different Communication Context (Main Effect)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of isolation</td>
<td>-.259</td>
<td>.374</td>
<td>.490</td>
<td>.772</td>
</tr>
<tr>
<td>Communication context</td>
<td>1.839</td>
<td>.634</td>
<td>.004</td>
<td>6.293</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>.000</td>
<td>.003</td>
<td>.940</td>
<td>1.000</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.009</td>
<td>1.052</td>
<td>.056</td>
<td>.134</td>
</tr>
</tbody>
</table>

*Note.* The sample size $N = 152$.

Table 6.4: Logistic Regression (Binary) For the Effect of Fear of Isolation on Topic Selection In Different Communication Context (Model with Interaction)

Table 6.5: Logistic Regression (Binary) For the Effect of Fear of Isolation on Topic Selection In Different Communication Context (Main Effect)
Hypothesis 2b predicted that participants in CMC will more likely to talk about controversial issue than those in FTF. It proposed there was an interaction between fear of isolation and communication context on topic selection. Therefore we tested the interaction in the logistic regression, and found it was not significant ($p = .153$). That is, there was no interaction between fear of isolation and communication context on topic selection. Thus, we ignored the interaction and examined the main effects in the model. We did not detect a significant effect of fear of isolation ($p = .490$) and the individual’s total number of utterances ($p = .940$) on the topic selection. The only significant effect we found is the communication context ($p < .005$). The odds ratio for communication context is 6.293. This indicates when the discussion group increases by one unit, that is, discussion changes from CMC to FTF, the estimated odds of talking about the issue of death penalty multiply by 6.293. People are more likely to talk about the death penalty in FTF, controlling for fear of isolation and individual’s total number of utterances. Therefore H2b was not supported. People were more likely to talk about the death penalty in FTF, instead of in CMC. This was just the opposite of our predication. Furthermore, it seemed that the fear of isolation did not play a role in the increased trend of talking about the death penalty in FTF.

Hypothesis 2c predicted that participants in CMC will more likely to talk about controversial issues early in the conversation in than those in FTF. ANOVA was used to test it. Results were shown in Table 6.6 and Table 6.7.
Table 6.6: ANOVA For The Effect of Fear of Isolation On the Order of The Death Penalty Being Brought Up In Conversation (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Context</td>
<td>1.758</td>
<td>.193</td>
</tr>
<tr>
<td>Fear of isolation (group level)</td>
<td>.000</td>
<td>.993</td>
</tr>
<tr>
<td>Total number of utterances of the discussion</td>
<td>.154</td>
<td>.697</td>
</tr>
<tr>
<td>Interaction (communication context* group level fear of isolation)</td>
<td>1.097</td>
<td>.302</td>
</tr>
</tbody>
</table>

Note. The sample size N = 40.

Table 6.7: ANOVA For The Effect of Fear of Isolation On the Order of The Death Penalty Being Brought Up In Conversation (Main Effect)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Context</td>
<td>.980</td>
<td>.329</td>
</tr>
<tr>
<td>Fear of isolation (group level)</td>
<td>.221</td>
<td>.641</td>
</tr>
<tr>
<td>Total number of utterances of the discussion</td>
<td>.644</td>
<td>.428</td>
</tr>
</tbody>
</table>

Note. The sample size N = 40.
H2c proposed there was an interaction between fear of isolation and communication context on the order of bringing up the death penalty in the discussion. Therefore we tested the interaction in ANOVA, and found it was not significant (F (1, 39) = 1.097, p = .302). Thus, we ignored the interaction and examined the main effect. No significant main effects were found. The main effect of communication context was not significant (F (1, 39) = .980, p = .329). People in FTF did not differ much from people in CMC in talking about the death penalty. The effect of group level fear of isolation was not significant, either (F (1, 39) = .221, p = .641). Nor is the effect of total number of utterances in the discussion significant (F (1, 39) = .644, p = .428). Therefore H2c was not supported. The effect of fear of isolation on the order of the controversial issue being raised in the discussion was not statistically different for participants in FTF and those in CMC.
<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Current)</td>
<td>-4.262</td>
<td>22.775</td>
<td>.852</td>
<td>.014</td>
</tr>
<tr>
<td>Communication context</td>
<td>-5.313</td>
<td>22.864</td>
<td>.816</td>
<td>.005</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.006</td>
<td>.006</td>
<td>.352</td>
<td>.994</td>
</tr>
<tr>
<td>Interaction (current perceived minority status *communication context)</td>
<td>4.929</td>
<td>22.783</td>
<td>.829</td>
<td>138.234</td>
</tr>
<tr>
<td>Constant</td>
<td>2.779</td>
<td>22.802</td>
<td>.903</td>
<td>16.107</td>
</tr>
</tbody>
</table>

*Note. The sample size N = 57.*

Table 6.8: Logistic Regression (Binary) For Effect of Perceived Minority Status (Current) on Minority Opinion Expression in Different Communication Context (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Current)</td>
<td>-006</td>
<td>.441</td>
<td>.989</td>
<td>1.006</td>
</tr>
<tr>
<td>Communication context</td>
<td>1.248</td>
<td>1.052</td>
<td>.235</td>
<td>3.482</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.006</td>
<td>.006</td>
<td>.293</td>
<td>.994</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.275</td>
<td>1.190</td>
<td>.056</td>
<td>.103</td>
</tr>
</tbody>
</table>

*Note. The sample size N = 57.*

Table 6.9: Logistic Regression (Binary) For Effect of Perceived Minority Status (Current) on Minority Opinion Expression in Different Communication Context (Main Effect)
Hypothesis 3a predicted that the effect of perceived minority status on minority opinion expression will be greater for those in FTF than in CMC. The results (as shown in Table 6.8 and Table 6.9) did not support hypothesis 3a. We did not detect any significant main effect or interaction in this hypothesis testing. H3a proposed there was an interaction between perceived minority status and communication context on minority opinion expression. Therefore we tested the interaction in the logistic regression, and found it was not significant ($p = .829$). Thus, we ignored the interaction and examined the main effects in the model. The main effect of the current perceived minority status on minority opinion expression was not statistically significant between FTF and CMC ($p = .989$). Neither the main effect of the communication context ($p = .235$) nor the main effect of total number of utterances of the individual ($p = .293$) on minority opinion expression was statistically significant.

We applied the same strategy in analyzing the effect of perceived minority status (future) on the minority opinion expression in different communication context and the results were showed below.
Table 6.10: Logistic Regression (Binary) For Effect of Perceived Minority Status (Future) on Minority Opinion Expression in Different Communication Context (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Future)</td>
<td>-.448</td>
<td>.977</td>
<td>.647</td>
<td>.639</td>
</tr>
<tr>
<td>Communication context</td>
<td>-1.068</td>
<td>2.664</td>
<td>.689</td>
<td>.344</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.002</td>
<td>.005</td>
<td>.744</td>
<td>.998</td>
</tr>
<tr>
<td>Interaction (current perceived minority status * communication context)</td>
<td>.970</td>
<td>1.315</td>
<td>.461</td>
<td>2.639</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.314</td>
<td>1.769</td>
<td>.458</td>
<td>.269</td>
</tr>
</tbody>
</table>

Note. The sample size $N = 60$.

Table 6.11: Logistic Regression (Binary) For Effect of Perceived Minority Status (Future) on Minority Opinion Expression in Different Communication Context (Main Effect)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Future)</td>
<td>.083</td>
<td>.633</td>
<td>.895</td>
<td>1.087</td>
</tr>
<tr>
<td>Communication context</td>
<td>.773</td>
<td>.970</td>
<td>.426</td>
<td>2.165</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.002</td>
<td>.005</td>
<td>.666</td>
<td>.998</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.237</td>
<td>1.361</td>
<td>.100</td>
<td>.107</td>
</tr>
</tbody>
</table>

Note. The sample size $N = 60$. 

Table 6.11: Logistic Regression (Binary) For Effect of Perceived Minority Status (Future) on Minority Opinion Expression in Different Communication Context (Main Effect)
The results were similar to the test for current opinion climate. There were no significant findings. The interaction was not significant, either \( (p = .461) \). The main effects of future perceived minority status \( (p = .895) \), communication context \( (p = .426) \), and individual's total number of utterances \( (p = .666) \) were not significant. Therefore hypothesis 3a was not supported. The effect of minority status on controversial topic selection in the discussion was not statistically different for participants in FTF and those in CMC.

Hypothesis 3b predicted that the effect of perceived minority status on controversial topic selection in the discussion will be greater for participants in FTF than those in CMC.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Current)</td>
<td>-.702</td>
<td>.853</td>
<td>.411</td>
<td>.496</td>
</tr>
<tr>
<td>Communication context</td>
<td>.137</td>
<td>1.853</td>
<td>.941</td>
<td>1.147</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>-.001</td>
<td>.003</td>
<td>.804</td>
<td>.999</td>
</tr>
<tr>
<td>Interaction (current perceived minority status*communication context)</td>
<td>.983</td>
<td>.940</td>
<td>.296</td>
<td>2.671</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.414</td>
<td>1.597</td>
<td>.376</td>
<td>.243</td>
</tr>
</tbody>
</table>

*Note. The sample size N = 133.*

Table 6.12: Logistic Regression (Binary) For the Effect of Perceived Minority Status (Current) on Topic Selection In Different Communication Context (Model with Interaction)
Results are shown in the above Table 6.12 and Table 6.13. H3b proposed there was an interaction between perceived minority status and communication context on topic selection. Therefore we tested the interaction in the logistic regression, and found it was not significant ($p = .296$). Thus, we ignored the interaction and examined the main effects in the model. We did not detect a significant effect of current perceived minority status ($p = .778$) and the individual’s total number of utterances ($p = .765$) on the topic selection. The only significant effect we found is the communication context ($p < .005$). The odds ratio for communication context is 7.672. This indicates when the discussion group increases by one unit, that is, discussion changes from CMC to FTF, the estimated odds of talking about the issue of death penalty multiply by 7.672. People are more likely to talk about the death penalty in FTF, controlling for current perceived minority status and individual’s total number of utterances.
The same strategy was used to analyze the effect of perceived minority status (future) on the minority opinion expression in different communication context and the results are presented below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Minority Status (Future)</td>
<td>-.350</td>
<td>.849</td>
<td>.680</td>
<td>.705</td>
</tr>
<tr>
<td>Communication context</td>
<td>1.189</td>
<td>1.927</td>
<td>.537</td>
<td>3.283</td>
</tr>
<tr>
<td>Total number of utterances (individual)</td>
<td>.000</td>
<td>.003</td>
<td>.998</td>
<td>1.000</td>
</tr>
<tr>
<td>Interaction (future perceived minority status*communication context)</td>
<td>.303</td>
<td>.991</td>
<td>.760</td>
<td>1.354</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.885</td>
<td>1.608</td>
<td>.241</td>
<td>.152</td>
</tr>
</tbody>
</table>

*Note. The sample size N = 135.*

Table 6.14: Logistic Regression (Binary) For the Effect of Perceived Minority Status (Future) on Topic Selection In Different Communication Context (Model with Interaction)
Table 6.15: Logistic Regression (Binary) For the Effect of Perceived Minority Status (Future) on Topic Selection In Different Communication Context (Main Effect)

The results (see Table 6.14 and Table 6.15) were similar to the previous one. There were no significant findings. The interaction was not significant \((p = .760)\). The main effects of perceived minority status for future \((p = .771)\) and individual’s total number of utterances \((p = .992)\) were not significant. The only significant effect we found is the communication context \((p < .05)\). The odds ratio for communication context is 5.757. This indicates when the discussion group increases by one unit, that is, discussion changes from CMC to FTF, the estimated odds of talking about the issue of death penalty multiply by 5.757. People are more likely to talk about the death penalty in FTF, controlling for future perceived minority status and individual’s total number of utterances. Therefore H2b was not supported. People were more likely to talk about the death penalty in FTF, instead of in CMC. This was just the opposite of our predication.
Combined the results we got from the logistic regressions for the effect of current and future perceived minority status, hypothesis 3b was not supported. People were more likely to talk about the death penalty in FTF, which was just the opposite of our predication. Furthermore, it seemed that the perceived minority status did not play a role in the increased trend of talking about the death penalty in FTF.

Hypothesis 3c predicted that feeling they are in minority status, participants in CMC will more likely to talk about controversial issue early in the discussion than those in FTF. ANOVA was used to test it. Results were shown in Table 6.16 and Table 6.17.

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication context</td>
<td>.002</td>
<td>.964</td>
</tr>
<tr>
<td>Perceived minority status (current)</td>
<td>.000</td>
<td>.995</td>
</tr>
<tr>
<td>Total number of utterances of the individual</td>
<td>.067</td>
<td>.797</td>
</tr>
<tr>
<td>Interaction (communication context* current</td>
<td>.622</td>
<td>.432</td>
</tr>
<tr>
<td>perceived minority status)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. The sample size N = 133.*

Table 6.16: ANOVA For The Effect of Perceived Minority Status (Current) On the Order of The Death Penalty Being Brought Up In Conversation (Model with Interaction)
Table 6.17: ANOVA For The Effect of Perceived Minority Status (Current) On the Order of The Death Penalty Being Brought Up In Conversation (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication context</td>
<td>2.793</td>
<td>.097</td>
</tr>
<tr>
<td>Perceived minority status (current)</td>
<td>.003</td>
<td>.957</td>
</tr>
<tr>
<td>Total number of utterances of the individual</td>
<td>.105</td>
<td>.747</td>
</tr>
</tbody>
</table>

*Note.* The sample size N = 133.

H3c proposed there was an interaction between perceived minority status and communication context on the order of bringing up the death penalty in the discussion. Therefore we tested the interaction in ANOVA, and found it was not significant (F (1, 132) = .622, *p* = .432). Thus, we ignored the interaction and examined the main effect. No significant main effects were found. The main effect of communication context was not significant (F (1, 132) = 2.793, *p* = .097). The effect of current perceived minority status was not significant, either (F (1, 132) = .003, *p* = .957). Nor is the effect of total number of utterances of the individual (F (1, 132) = .105, *p* = .747).

The same strategy was used to analyze the effect of perceived minority status (future) on the order of the controversial issue being brought up in the discussion in different communication context and the results were showed below (Table 6.18 and Table 6.19).
<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication context</td>
<td>.245</td>
<td>.622</td>
</tr>
<tr>
<td>Perceived minority status (future)</td>
<td>.296</td>
<td>.588</td>
</tr>
<tr>
<td>Total number of utterances of the individual</td>
<td>.006</td>
<td>.938</td>
</tr>
<tr>
<td>Interaction (communication context* future perceived minority status)</td>
<td>.002</td>
<td>.962</td>
</tr>
</tbody>
</table>

*Note.* The sample size \( N = 135 \).

Table 6.18: ANOVA For The Effect of Perceived Minority Status (Future) On the Order of The Death Penalty Being Brought Up In Conversation (Model with Interaction)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication context</td>
<td>1.578</td>
<td>.211</td>
</tr>
<tr>
<td>Perceived minority status (future)</td>
<td>.296</td>
<td>.588</td>
</tr>
<tr>
<td>Total number of utterances of the individual</td>
<td>.007</td>
<td>.936</td>
</tr>
</tbody>
</table>

*Note.* The sample size \( N = 135 \).

Table 6.19: ANOVA For The Effect of Perceived Minority Status (Future) On the Order of The Death Penalty Being Brought Up In Conversation (Main Effect)
The results (see Table 6.18 and Table 6.19) were similar to the previous one. There were no significant findings. The interaction was not significant \((F (1, 134) = .002, p = .962)\). The main effect of communication context was not significant \((F (1, 134) = 1.578, p = .211)\). The effect of future perceived minority status was not significant, either \((F (1, 134) = .296, p = .588)\). Nor is the effect of total number of utterances of the individual significant \((F (1, 134) = .007, p = .936)\).

Combined the results we got from the ANOVA for the effect of current and future perceived minority status, hypothesis 3c was not supported. The effect of perceived minority status on the order of the controversial issue being discussed in the discussion was not statistically different for participants in FTF and those in CMC.
CHAPTER 7

DISCUSSION

The purpose of this study was to discover whether the spiral effect can be detected in the CMC and what were the underlying mechanisms that caused the spiral effect to work or not work.

As we described in the literature review, the studies on minority opinion expression in CMC revealed inconsistent findings. Sometimes the equalization effect was observed; sometimes it was not. This study revealed that the minority opinion expression was not different in CMC compared to FTF. It suggested that in CMC, although people were protected by higher degree of anonymity, this did not necessarily make them more vocal and more willing to express a minority opinion. In this sense, the equalization perspective was not supported in this study.

The findings of this study revealed no significant spiral effect in both FTF and CMC settings. Neither the fear of isolation nor the perceived minority status influences the minority opinion expression in either communication context. This was similar to most other spiral of silence studies, as revealed in Glynn et al. (1997)’s meta-analysis, which did not detect a strong spiral effect, either.
The extant literature on the spiral of silence showed a mixed picture on the relationship between perceived support and the willingness to express minority opinion. The meta-analysis of Glynn et al., (1997) indicated a weak and negligible correlation of .03. In our study, the fear of isolation and perceived minority status did not exert an impact on influencing the minority opinion expression. Furthermore, it seemed that the effect of these two variables was not statistically different in FTF and in CMC, either. We found that the effect between perceived support for one’s own opinion and actual minority opinion expression did not differ as a function of whether that perception refers to “current” or “future” support. This also corresponded with the findings in the meta-analysis.

As we argued that there were different ways to conceptualize “speaking out” and “remaining silent,” topic selection in the discussion was a very important factor that we should examine. Although we did not find any significant effect of the fear of isolation, perceived minority status and communication context on minority opinion expression and the order of bringing up the issue of death penalty in the discussion, we detected a significant effect of communication context on the topic selection. In the opposite of our predictions, the likelihood of talking about the controversial issue was higher in FTF than in CMC. The results indicated as communication context changed from CMC to FTF, people were more likely to talk about the death penalty in the discussion. Furthermore, when this communication context change occurred, the fear of isolation and perceived minority status did not seem to play a role in influencing the topic selection. Therefore, it
suggested that there may be other factors influencing the topic selection, which came along with the communication context (FTF vs. CMC), which the previous spiral of silence study did not examine.

Exploring the literature on CMC, we can see that one important distinction between FTF and CMC is the amount of social cues it presents. The current CMC literature looks at how the communicative cues available in online settings affects the ensuing interaction and different approaches are proposed to interpret it in terms of the cues people consider and their conceptions of how people use those cues (Walther & Parks, in press). The cues-filtered-out approach refers to the social presence theory (Short et al., 1976) and focuses on the concept of bandwidth, which is defined as “the number of communication cue systems a technology can convey, specially, the incremental addition to verbiage of voice, kinesics, and proxemics.” (Walther & Parks, in press).

Social presence theory argues that social cues make the presence of communicators more salient to one another and enhance the warmth and friendliness of interaction (Short et al., 1976). Echoing this argument, researchers (e.g. Kiesler, et al., 1984; Seigel, et al., 1986; Sproull & Kiesler, 1986) pointed out that lack-of-cues online environment would make communicators become disinhibited and hostile (e.g. flaming).

In our study, we examined how provocative people were in FTF and CMC. One of that is the likelihood of them for talking about the controversial issue. We found people in FTF discussion talked more about the death penalty than those in CMC. In this sense, people were more provocative and disinhibited in FTF. This finding did not comply with the arguments of the cue-filtered-out approach, which claims that CMC is impersonal, thus communicators in CMC are more disinhibited. This study suggested that
social cues may have dual function in influencing topic selection. According to the social presence theory, social cues make the presence of communicators more salient to one another and increase the warmth and friendliness of interaction. On one hand, this may make communicators more willing to support each other’s opinion and create a more compliable environment for opinion expression; on the other hand, it may also enhance the perceived tolerance of talking about the controversial issue in FTF setting. Once an individual considers other participants in the discussion as warm and friendly, he/she may feel higher degree of freedom to talk about the controversial issue and become more vocal and provocative.

Besides the possible influence of social cues, there may be other factors that also have an impact on the communication patterns in both communication contexts. Exploring the literature on communication research, the undiscovered factors in our study may be the face-work influence, which may exert different extent of influence in FTF and CMC.

Goffman (1967) defined the term face as “the positive social value a person effectively claims for himself by the line others assume he has taken during a particular contact.” (p.5) By claiming face is a positive social value, he implied three features of the face: first, the concept face is socially defined (since it is a social value); second, face should be presented and observed in public eyes (since it involves two-sided social interactions); third, face should be achieved through mutual acceptance or consensus on both parts, this is because the concept face connects a person’s own line, stance or perception with others’ evaluation. Noelle-Neumann (1991) pointed out in her spiral of silence theory that “the word public in the concept of ‘public opinion’ was to be
interpreted in the sense of ‘public eye,’ ‘visible to all’, and thus as social control” (p. 256). As we can see that face can also be observed and evaluated through the “public eye” and it could be a possible mean of social control.

O’Sullivan (2000) found that the presence of potential face threats to the sender or receiver in interpersonal encounter might affect media choice. Therefore, if we borrow the concept of face and face-work from FTF interaction literature and apply it to the CMC research, we may observe a different degree of influence of it on different communication context. Expressing a controversial opinion may be considered by participants as a face threatening act (Brown & Levinson, 1978). In making the decision to speaking up or remain silence, a lot of payoffs and tradeoffs were involved, for instance, the fear of isolation, threat of losing face and the general expectation for politeness. All these factors are closely related to each other. The central claim of politeness theory is that there are many verbal strategies of politeness and that the selection of a strategy is governed by the degree of estimated risk of face loss (e.g. the wish to be unimpeded, free from imposition) (Brown, 1990). Since the results suggested that the fear of isolation did not differ much in FTF and CMC, it was inappropriate to attribute the difference on topic selection in FTF and CMC to the decreased power of fear of isolation, as we proposed at the beginning. Therefore, it suggested we may take the threat of face-work into consideration when we conducted future research. In other words, if we can observe the face and face-work work differently in FTF and CMC, this may serve as an alternative to explain why the likelihood to talk about the controversial issue varies in different communication context.
Furthermore Goffman’s (1966) involvement obligation theory may also be used to explain this finding. His theory argued that in FTF communication, people are bound by a system of etiquette to remain involved in conversation. This obligation motivates them to listen to what others say, and makes it a responsibility to ensure that other interactants remain involved in the conversation. While in CMC context, the involvement obligation is low, thus it’s easier for people to remain silent. In this sense, remaining silent is more like a strategic tool to balance the payoffs and tradeoffs of silence vs. speaking out.

Wanta and Dimitrova (2000) found that in the chatroom discussion during the final presidential debate of 1996, supporters of Senator Bob Dole because more silent when they believed he was doing poorly in the debate. Dole supporters tended to not speak up, despite the estimated risk of social sanctions in that anonymous communication context was low. Therefore we may argue that in FTF context, due to the high involvement obligation, people perceive a duty to take stance and defend their position, whereas in CMC context, the low involvement obligation makes people more likely to remain silent. Since they feel they should defend their viewpoint once challenged, which may cause people in FTF tend to talk about the controversial issue more than those in CMC.

In our study, the hypotheses were not supported. Besides the above discussions on the effect of face-work, the reasons for not detecting the significant effects may be the weak points of this study.
Limitations of Current Research

Control on Discussion

One limitation of this study was the experimental design. This study was part of a larger project, which examined not only the spiral of silence, but also the effect of discussion on knowledge and learning processes.

In this study, we did not require participants to talk about the issue of the death penalty in particular. Instead, we gave them the flexibility to choose among a number of topics for discussion, as long as the topic was an “issue affecting Columbus.” Therefore, on one hand this could be regarded as an advantage of this study, since it examined something most prior research has not examined – topic selection and the order of issues being brought up in the discussion, which allowed us to expand the conceptualization of “speaking up.” On the other hand, as the expense of doing that, we sacrificed control, to some extent, of the discussion. Although a discussion moderator jumped in and reminded the participants to focus on the issues affecting Columbus when the discussion went off track, the control of the discussion was not as strong as previous experimental studies of the spiral of silence (e.g. Hayes, et al., 2001), which only addressed one or several controversial issues.

Fear of Isolation Scale

Reliability

Another limitation of this study was the fear of isolation measure. The reliability of this measure was .63 in this study. This 6-item fear of isolation measure was adapted from Moy’s (1999) and Scheufele’s (2001) 7-item scale, which was an unweighted
composite of seven items tapping positive and negative emotions related to conversational situations. Scheufele (2001) reported the reliability for this measure was alpha = .72.

Neuwirth (2000) revealed two-factors in this measure. The first was general fear, which incorporated elements of normative principles operating in primary groups and the emotion of worry (alpha = .51). The second factor was discussion fear (alpha = .25), which reflected maintaining one’s views despite negative consequences. Neuwirth (2000) labeled these two factors as “state” and “trait” definition of fear of isolation respectively. He argued that a “trait” was a relatively static quality of an individual and a “state” was a transitory mental event and claimed that fear of isolation in the spiral of silence appeared to be more state-like than trait-like in nature.

Neuwirth (2000) pointed out that in measuring fear of isolation, researchers employed mixed strategies. He raised the “embarrassment” measure used by Noelle-Neumann (1991), which was a more trait-like measure, and the “concern” measure of Glynn and Park (1997), which was a more state-like measure, and the mixed measure of Scheufele (1999) as examples.

As we conducted the factor analysis for this 6-item fear of isolation scale, it did reveal two factors. But when we collapsed these two factors respectively, it only slightly improved the reliability. (alpha = .64 for the former, alpha = .65 for the latter) Furthermore, the two factors we found in the factor analysis did not completely comply with the two factors as Neuwirth found in his study. In our study the emotion of worry and concern of being isolated or avoided if disagreeing or being disagreed with is one
factor; while unwillingness to get into arguments and the negative consequences of getting into arguments formed the second factor. Therefore it showed there might be different dimensions of fear of isolation, which we should explore further.

For improving the measure, Neuwirth (2000) suggested that it is worth considering using the Communication Anxiety Inventory (CAI) developed by Booth-Butterfield and Gould (1986) as a way to measure fear of isolation, since CAI incorporates both trait and state features. Petric and Pinter (2002) adopted the “trait” definition of fear of isolation and made their fear of isolation measure based on the fear of social exposure measure. (e.g. “I feel uncomfortable meeting other people.” “I avoid social gatherings.”)

Validity

Another problem of using this fear of isolation measure is the wording of the measure itself. Although we placed this measure in the post-test to avoid priming effects, which probably occur if the measure is placed in the pre-test, we can not be certain about the validity of this measure in this study.

The wording of the items used in this measure was general. They are not in specific reference to the communication context of FTF vs. CMC. The potential problem of this wording is that participants may provide answers in general sense, instead of putting themselves in the concrete communication context (FTF/CMC) when they answer these questions. That is, the fear of isolation we got from the questionnaire may be the fear of isolation of the person in general, instead of the particular fear of isolation that
person experienced in the most recent experimental setting (FTF/CMC). This may explain why we did not detect statistically different fear of isolation for people in FTF and in CMC.

Lack of Manipulation on Anonymity & Social Cues

The third limitation of this study is that it did not directly manipulate the degree of anonymity and the social cues, although they were somewhat implied by putting participants into different communication settings (FTF vs. CMC).

Anonymity and the presence of social cues can be different under certain circumstances in online communication. For example, we can provide brief descriptions of the demographic characteristics of the online communicators (e.g. gender, age, race, income, occupation), therefore CMC participants will know some information about each other, but they still can not identify each other, since the online discussion partners are still anonymous. The anonymity and the presence (or absence) of social cues may interact with each other in affecting fear of isolation. Therefore it will be better for the future research to manipulate these two features directly.

Consensus vs. Tolerance

Public opinion literature looks at different ways of social integration. The traditional sociological approach claims that the integration of a social system rests on consensus (e.g. Gross, Mason, & McEachern, 1958; Scheff, 1967), while other researchers (e.g. Moore, 1969) question this assumption and pay the attention to the concept of “tolerance.” He argued that social integration may not necessarily rely on consensus. In societies where cultural pluralism is valued, “integration rests on tolerance rather than on substantive agreement.” (p.293). He suggested that tolerance can serve as
an alternative to consensus. If we apply his ideas into the public opinion studies, we can find that the spiral of silence theory only looks at the perceived support of one’s own opinion, which is based on the consensus, while ignoring the perceived tolerance of one’s own opinion. Fail to take this into consideration, this study did not include the perceive tolerance of one’s own opinion as a component of the perceived status (minority vs. majority) measure.

Time Effect on CMC Discussion

The last thing we want to talk about is the time effect on this study. Recent CMC literature argues that the communication differences between FTF and CMC is due to the time strain of the online communication, since the information exchange in CMC is much slower than in FTF (e.g. typing is much slower than speaking). Therefore given sufficient time, the communicators in CMC will catch up with those in FTF and the communication will reach the same level in both communication settings (e.g. Walther & Parks, in press).

This argument originated specifically from studies on relational development in CMC. In our study we examined political discussion, which is a different setting from those communication practice aimed for future relation development. Furthermore, although CMC literature showed that relations developed online may migrate offline (e.g. Parks & Floyd, 1996; Parks & Roberts, 1998), these findings were all obtained by studying relationship development in CMC. The communication purposes of online political discussion and online relationship development are different. Simply applying these findings into online political discussion may be problematic. Therefore, the rationale for the argument of time effect may not apply in our study.
Participants Training

Although we required the temporary employment agency recruited participants who had the skill of using Internet, some participants seem uncomfortable in using the online chatting system. Due to time constraints, we did not spend much time training the participants. Although we recorded the typing speed of the online discussants, this did not completely solve the problem caused by the gap between those experienced Internet users and “newbies.” For example, the participants who were not familiar with online chatting may feel uncomfortable and did not know what to do at the beginning of the discussion. Based on the moderator’s observation, it took them more time to engage in the discussion than those experienced Internet users. Therefore, in future research, we should also better train the participants and ask them how comfortable they feel in using the chat system, and statistically control this factor.

Features of the Issue

Besides the comfortable level, there are other factors which may affect minority opinion expression online. For instance, how informed participants perceive themselves on the given issue, how sensitive they consider the issue, how interesting they think the given issue is, and to what extent the participants perceive the issue contains a “moral” component, and how comfortable they are in using online chatting system may all be important factors. In our experiment, we did not ask the participants these questions. Instead we conducted a survey to address to these questions by using another sample (undergraduate students), which did not engage in the discussion. Therefore, in future research, it will be better for us to obtain such data from the same sample (that is, people who really participate the discussion) and statistically control for these factors.
Race Concern

The last point for future research is the demographic factors, especially the race. Racial discrimination in the application of the death penalty still exists nowadays. According to the death row report (1996) that African-Americans are sentenced to death much more than their proportion in the U.S. population. Statistics showed that around 40% of those on death row are black; 39% of those executed have been black; while blacks constitute about 12% of U.S. population. In our study, blacks comprised 38.8% of the sample, which was much higher than its proportion in the national population. Therefore, the racial disparity on the practice of the death penalty may make participants perceive this issue racist, which in turn influenced the opinion expression on the death penalty. Therefore, in future research we should take race into consideration and control it.

Future Research

Being aware of the limitations of this study, the direction for future research should be carried on in the following aspects:

First, a more reliable fear of isolation measure should be made. We may combine all the items from the CAI measure (Butterfield & Gould, 1986), fear of social exposure measure (Petric & Pinter, 2002) and Scheufele’s (2001) fear of isolation measure, and conduct another factor analysis to further explore the different dimension of fear of isolation.
Second, for improving the validity of the fear of isolation measure, we should make the communication context more salient in the questionnaire. If we could measure the fear of isolation more accurately in FTF and CMC, we might detect the significant main effect of fear of isolation and the interaction between these two variables.

In future research, we should change the wording of the questions on fear of isolation. For instance, we can design two versions of fear of isolation measure. The only difference is in the first paragraph of the instruction. For the FTF version, we can phrase it as this way:

"Please indicate your level of agreement with the following statements in the FACE-TO-FACE discussion you just had. Circle the number that corresponds with your response. For each of the following statements, please indicate whether you (1) "Strongly Disagree," (2) "Disagree," (3) "Feel Neutral," (4) "Agree," or (5) "Strongly Agree" with each statement." For the CMC version, we can simply change the word "FACE-TO-FACE" to "ONLINE."

By targeting the communication context directly in the question, we hope to assess the particular fear of isolation of the person in different experimental setting (FTF/CMC), instead of an individual's general fear of isolation.

Third, we can directly manipulate the degree of anonymity and the social cues in the experiment. As we talked before, a brief description of the participants can be attached to the message the online communicators send on the screen. Thus, more social cues will be provided, while the degree of anonymity still remains the same. Also we can vary the degree of social cues, for instance, add the audio and video features to the online discussion, and compare the effect of them with the pure-text message exchange in CMC.
Fourth, although time effect argument (e.g. Walther & Parks, in press) may not applicable to our study, it is still interesting to explore the time effect on the online political discussion. For the future research, we may compare long-term online participants and those who occasionally engage in the online political discussion, and observe how they differ in experiencing fear of isolation and expressing minority opinion.

Besides these points, for future research, we should also train the participants better, include the measure of perceived tolerance of one’s own opinion in the questionnaire, and take the nature of different issues and the demographic (especially race) factors into consideration.

Conclusions

Like most of the previous spiral of silence research, this study did not reveal a strong spiral effect. It did not find a significant difference on the minority opinion expression in FTF versus CMC. The minority opinion expression did not increase in CMC as predicted. Fear of isolation and the perceived minority status did not play a role in influencing minority opinion expression and the order of bringing up the controversial issue in both communication settings. The only significant finding was that the communication context did affect the topic selection---People in FTF were more likely to talk about the controversial issue than people in CMC, which was just the opposite of the hypothesis. Since we conceptualized topic selection as a mean of “speaking up,” this could be regarded as an illustration of a less salient spiral effect in FTF. Meanwhile this increased willingness to talk about controversial issue in FTF could not be attributed to the influence of two traditional independent variables---fear of isolation and perceived support of one’s own opinion. It suggested there may be other undiscovered factors
which come along with the communication context (FTF vs. CMC) in affecting the formation of the silence spiral. The function of social cues, involvement obligation, and the effect of face and face-work deserve the attention of future studies.
LIST OF REFERENCES


Scott, C. R. (1999). The impact of physical and discursive anonymity on group members’ multiple identifications during computer-supported decision making. Western Journal of Communication, 63, 456-487.


APPENDIX A

ATTITUDES TOWARD PUBLIC ISSUES SURVEY
Below is a list of public policy issues that are often debated by political leaders as well as members of the public. Please circle your response based on the extent to which you would consider the issue an “interesting” topic of discussion, using a scale from ONE to SEVEN where ONE means “Not at all Interesting” and SEVEN means “Very Interesting.”

<table>
<thead>
<tr>
<th>Issue</th>
<th>Not at all Interesting</th>
<th>Very Interesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Affirmative Action</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Death Penalty</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Sexual Harassment</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Crime</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Urban Growth</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Abortion</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

Using the same public policy issues that are often debated by political leaders as well as members of the public, this time we would like you to circle your response based on the extent to which the issue contains a “moral” component using a scale from ONE to SEVEN where ONE means “No Moral Component” and SEVEN means “Strong Moral Component.” By moral component, we mean that opinions on the issue are based on fundamental values of right and wrong, whether those values come from religious teachings or simply matters of conscience.

<table>
<thead>
<tr>
<th>Issue</th>
<th>No Moral Component</th>
<th>Strong Moral Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>1 2 3 4 5 6 7</td>
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</tr>
<tr>
<td>Affirmative Action</td>
<td>1 2 3 4 5 6 7</td>
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<td>Transportation</td>
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<tr>
<td>Death Penalty</td>
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<tr>
<td>Taxes</td>
<td>1 2 3 4 5 6 7</td>
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</tr>
<tr>
<td>Sexual Harassment</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>Education</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Crime</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Urban Growth</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Abortion</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
Using the same public policy issues that are often debated by political leaders as well as members of the public, this time we would like you to circle your response based on the extent to which you would consider the issue a “**sensitive**” topic of discussion, using a scale from ONE to SEVEN where ONE means “Not at all Sensitive” and SEVEN means “Very Sensitive.” By “sensitive” we mean that if people who disagreed on this topic were to discuss it, there would be a high likelihood of someone becoming offended or angry.

<table>
<thead>
<tr>
<th></th>
<th>Not at all Sensitive</th>
<th>Very Sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Affirmative Action</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Transportation</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Death Penalty</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>Taxes</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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<td>Sexual Harassment</td>
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<td>1 2 3 4 5 6 7</td>
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<tr>
<td>Education</td>
<td>1 2 3 4 5 6 7</td>
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</tr>
<tr>
<td>Crime</td>
<td>1 2 3 4 5 6 7</td>
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</tr>
<tr>
<td>Urban Growth</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Abortion</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

Using the same public policy issues that are often debated by political leaders as well as members of the public, this time we would like you to circle your response based on the extent to which you would consider yourself “**informed**” about the issue, using a scale from ONE to SEVEN where ONE means “Not at all Informed” and SEVEN means “Very Well Informed.” By “informed” we mean that you have relevant facts and information and are aware of the various arguments about the issue.

<table>
<thead>
<tr>
<th></th>
<th>Not at all Informed</th>
<th>Very Well Informed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Affirmative Action</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Transportation</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Death Penalty</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Taxes</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Sexual Harassment</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Education</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Crime</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Urban Growth</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Abortion</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
Finally, we'd like to know a little about you. Please answer the following questions.

Please indicate your age as of your last birthday: ______ years

Please put an X in the appropriate box to indicate if you are: □ Male □ Female

Please put an X in the appropriate box to indicate if you are: □ Single (never married) □ Married □ Widowed □ Divorced □ Separated

What race do you consider yourself? Please put an X in all boxes that apply: □ Caucasian/White □ African-American □ Asian-American □ Hispanic □ Other

What is your current status at OSU: □ Freshman □ Sophomore □ Junior □ Senior □ Graduate student □ Other
Please put an X in the appropriate box indicating your estimated annual household income:

- ☐ under $10,000
- ☐ $10,000-$19,999
- ☐ $20,000-$29,999
- ☐ $30,000-$39,999
- ☐ $40,000-$49,999
- ☐ $50,000-$59,999
- ☐ $60,000-$69,999
- ☐ $70,000-$80,000
- ☐ over $80,000

Generally speaking, do you think of yourself as a Republican, a Democrat, an Independent, or what?

<table>
<thead>
<tr>
<th>Very Strong Democrat</th>
<th>Very Strong Democrat</th>
<th>Closer to Closer to Republican</th>
<th>Strong Republican</th>
<th>Strong Republican</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

When it comes to **economic issues**, do you usually think of yourself as very liberal, liberal, somewhat liberal, moderate or middle of the road, somewhat conservative, conservative, or very conservative?

<table>
<thead>
<tr>
<th>Very Liberal</th>
<th>Somewhat Liberal</th>
<th>Somewhat Conservative</th>
<th>Very Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

When it comes to **social issues**, do you usually think of yourself as very liberal, liberal, somewhat liberal, moderate or middle of the road, somewhat conservative, conservative, or very conservative?

<table>
<thead>
<tr>
<th>Very Liberal</th>
<th>Somewhat Liberal</th>
<th>Somewhat Conservative</th>
<th>Very Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX B

INSTRUCTIONS FOR EXPERIMENT
Discussion Expectation Instructions

Please choose a computer that is on. Click on the icon labeled “Site.” If you have trouble accessing this page, let me know and I will help you. You have 20 minutes to read through this site. Please spend the entire 20 minutes on this site, do not browse the Internet outside of this site. I will tell you when your 20 minutes is finished. **Once you have looked over the information on this site you will be asked to discuss what you read with a group of people-howeve, do not discuss what you read with anyone during this part of the study.**
Discussion Instructions (FTF)

You will now participate in a discussion. Some of the people involved in this discussion will have just completed reading news about and affecting the Columbus area, but others will not have read this information. We would like you to discuss issues related to the Columbus area. For this discussion, you can use any one or more of the following as your goal(s):

1. Seek information from others to learn or better understand something
2. Seek information from others to help in forming an opinion
3. Share information with others or help others understand something
4. Express an opinion to others
5. Learn about the opinions held by others and why they hold them
6. Try to persuade others to hold the same opinion as you do

It is important that you keep the discussion focused on news about and affecting the Columbus area. A moderator will be in the room to monitor the discussion. Your conversation will be recorded for later analysis, but all of your comments will remain confidential. Once you have completed reading these instructions, turn them over to indicate that you are done. Once the moderator tells you that you may begin the discussion, please continue the discussion until the moderator tells you to stop.

CMC Discussion Instructions

You will now participate in an online discussion. Some of the people involved in this discussion will have just completed reading news about and affecting the Columbus area, but others will not have read this information. We would like you to discuss issues related to the Columbus area. For this discussion, you can use any one or more of the following as your goal(s):

1. Seek information from others to learn or better understand something
2. Seek information from others to help in forming an opinion
3. Share information with others or help others understand something
4. Express an opinion to others
5. Learn about the opinions held by others and why they hold them
6. Try to persuade others to hold the same opinion as you do

It is important that you keep the discussion focused on news about and affecting the Columbus area. An online moderator will be in the chat room to monitor the discussion. Your conversation will be recorded for later analysis, but all of your comments will remain confidential. When you are finished reading these instructions click on the “Chat” icon on the desktop and WAIT for the online moderator to tell you when to start the discussion. Please continue the discussion until the moderator tells you to stop. If you need help at any time, please place the paper marked “Help” in the door.
APPENDIX C

MEASUREMENT WORDING
Fear of Isolation

The following statements refer to the conversation you just had. Please indicate your level of agreement with the statements as they pertain to the conversation. Please circle the number that corresponds with your response. For each of the following statements, please indicate whether you (1) “Strongly Disagree,” (2) “Disagree,” (3) “Feel Neutral,” (4) “Agree,” or (5) “Strongly Agree” with each statement.

I don’t tell other people my opinion when there’s a risk they’ll avoid me because of it.
I try to avoid getting into arguments.
Arguing over controversial issues improves my understanding of those issues.
I don’t worry about other people avoiding me.
I enjoy a good argument about a controversial issue.
I worry about being isolated if people disagree with me.

Perceived Minority Status

Current perceived minority status

1. What would you say is your personal opinion toward the death penalty?
   A) I favor the death penalty
   B) I oppose the death penalty

2. Thinking about the people with whom you discussed issues in this study today, which of the following do you think best represents opinions about the death penalty:
   D) a majority favor the death penalty
   E) a majority oppose the death penalty
   F) attitudes toward the death penalty are split evenly between those who favor and those who oppose

Future trend of perceived minority status

3. Thinking about the people with whom you discussed issues in this study today, which of the following do you think best represents opinions about the death penalty:
   D) opinions are changing toward them favoring the death penalty
   E) opinions are changing toward them opposing the death penalty
   F) opinions are holding steady---there is no change in overall opinions toward the death penalty.
APPENDIX D

CODE BOOK FOR DISCUSSION STUDY
Utterance Coding for Discussion Study

Coder ID#: __________________________ Discussion ID #: __________________________

Utterance #: ________________________ Respondent ID #: __________________________

# of Words: __________________________

Topic of Utterance (check all that apply):

1 ___ Crime
2 ___ Transportation
3 ___ Death Penalty
4 ___ Education
5 ___ Urban Growth
6 ___ Taxes
7 ___ Economy
8 ___ Task-oriented
9 ___ Other

10 ___ Unclear / Could Not Code

Utterance Classification:

Assertion of Fact
11 ___ Accurate restatement of news
12 ___ Inaccurate restatement of news
If answer to knowledge question, which one? #: _____
13 ___ Not restatement of news

Request for Fact
21___ Related to Public Issues
22___ Related to Group Member
23___ Other

Request for Opinion
31___ Request for Opinion
32___ Request for Opinion Related to Topic Selection

Assertion of Opinion
41___ Assertion of Opinion Not About Death Penalty
Direction of opinion: __________________________
42___ Assertion of Opinion Favoring Death Penalty – Not a Response
43___ Assertion of Opinion Favoring Death Penalty – Direct Response
44___ Assertion of Opinion Opposing Death Penalty – Not a Response
45___ Assertion of Opinion Opposing Death Penalty – Direct Response

Other
51___ Other

Could Not Code
99___ Unclear / Could Not Code
Utterance Coding Rules for Discussion Study

**Coder ID:** This is the person who is coding the particular utterance. ID#s are:

- Chip = 5
- Juliann = 1
- Mi hye = 4
- Li = 6
- Ioana = 2
- Zuoming = 3

**Discussion ID#:** This represents the code assigned to each of the discussion groups. This number will be marked in pen at the beginning of each of the printed discussion transcripts. We will use this number to later relate back to information such as the condition (Web vs. FTF), the time and date, the moderator, and so forth.

**Utterance #:** One we have unitized the discussions, each will be given a sequential utterance number. That is, the first utterance in a given discussion group will be given the # of “1,” the second will get “2” and so forth. These numbers will appear on the printed transcripts that you will use to code the utterances. They will later be used if we decide to do any sequential or time series analyses of these conversations.

**Respondent ID#:** This number represents the subject who is speaking the utterance. This number will also be listed, for each utterance, in the printed transcripts. We will use this number to link the respondent’s utterances in the discussion to his or her responses to the surveys, as well as information such as the condition number (exposure or not, notification or not).

**# of Words:** This is the raw count of words in the utterance. Hyphenated words (“left-wing”) count as two words. Do not count words such as “um” that aren’t really words, but if a person speaks the same word twice (“like, like”) count this as two words.

**Topic of Utterance:** Classify the utterance into one or more of the following categories. If you are unable to do so by examining just the particular utterance you are coding, employ surrounding utterances (either before or after) as context to help you identify the topic. If the utterance concerns the task (reading, filling out surveys or puzzles) with no news content, indicate “task-oriented.” If the utterance does not fit in one of the topics from the news content or task-oriented, code it as “other” and write down a one or two word summary of the topic. If you are unable to code the utterance – that is, if you cannot even clearly put the utterance into the “other” category, code as “unclear / could not code.” IF YOU HAVE SELECTED EITHER “TASK-ORIENTED” OR “OTHER” AS THE CATEGORY, YOU DO NOT NEED TO CODE ANY OF THE REMAINING VARIABLES BELOW.
Utterance Classification (major classifications): Utterance of fact is when the discussant provides information that is not an expression of opinion. The term "fact" does not necessarily imply accuracy. A question of fact is when the discussant asks for information other than opinions, and this information may be classified as related to the news or related to a group member. Expression of opinion is when the discussant provides an opinion on a particular topic, regardless of whether or not that topic is one included in the news Web site used in this study. Any expression of opinion should be classified as such, and the direction of the opinion should be briefly indicated. Question of opinion is when the discussant asks for opinions from one or more of the group members.

Accurate restatement of news: An utterance concerning news information contained in the stimulus materials that is accurate according to a "gist" criterion. Gist means that the essence of the utterance was accurate, or that the utterance was more right than wrong.

Inaccurate restatement of news: An utterance concerning news information contained in the stimulus materials that is inaccurate according to a "gist" criterion.

For either of the above two codes, indicate whether or not the utterance is directly relevant to the knowledge question (based on the included list of questions) for the story to which it is a restatement.

Not a Restatement of News: This is for utterances that are statements of fact but are not restatements of news. This would essentially be utterances that are not attempted summaries of the news stories. Included in this category are utterances of what an individual would do (e.g. "If someone did that to me I'd run away.").

Request for Fact Related to Public Issues: Requests for facts are non-rhetorical questions designed to elicit information (as opposed to opinions) from one or more group members. Public issues refer to things including what is the highest crime neighborhood in Columbus, what did the stories talk about, and so forth.

Request for Fact Related to Group Member: Requests for facts are non-rhetorical questions designed to elicit information (as opposed to opinions) from one or more group members. Information about the group member includes things such as the number of children, where s/he lives, personal experiences with crime, and so forth.

Request for Fact Other: Requests for facts are non-rhetorical questions designed to elicit information (as opposed to opinions) from one or more group members. If a request for fact cannot be classified as related to public issues, a group member, or topic selection, it should be coded in this category.

Request for Opinion Related to Topic: Requests for opinions related to topic are non-rhetorical questions designed to elicit opinions (as opposed to information) from one or more group members on topics or issues.
Request for Opinion Related to Topic Selection: Requests for facts related to topic selection is when a participant raises questions about what topics should be discussed, or whether participants want to discuss a particular topic.

Assertion of Opinion Not About Death Penalty: Assertions of opinions are utterances that directly reveal the preferences of the individual on various issues. If the expression does not relate to the death penalty, provide a brief description of the opinion direction (e.g., “favors more bus routes” or “thinks there should be a tax increase”).

Assertion of Opinion Favoring Death Penalty – Not a Response: Assertions of opinions favoring death penalty – not a response are utterances that directly reveal support (even conditional support or limited support) of the death penalty that are offered without being directly requested by another member of the group.

Assertion of Opinion Favoring Death Penalty – Direct Response: Assertions of opinions favoring death penalty – direct response are utterances that directly reveal support (even conditional support or limited support) of the death penalty that are offered as a direct response to a request by another member of the group to either the individual or the group at large.

Assertion of Opinion Opposing Death Penalty – Not a Response: Assertions of opinions opposing death penalty – not a response are utterances that directly reveal opposition (even conditional opposition or limited opposition) of the death penalty that are offered without being directly requested by another member of the group.

Assertion of Opinion Opposing Death Penalty – Direct Response: Assertions of opinions opposing death penalty – direct response are utterances that directly reveal opposition (even conditional opposition or limited opposition) of the death penalty that are offered as a direct response to a request by another member of the group to either the individual or the group at large.

Other: If an utterance cannot be classified as some form of a statement of fact, request for fact, request for opinion, or expression of opinion, it should be classified as “other.”

Unclear / Could Not Code: If the utterance is simply not interpretable as a thought, even with the use of surrounding utterances as context, it should be classified in this category. This category will include garbled utterances, interrupted expressions, and some incomplete sentences.
APPENDIX E

UNITIZATION CODING RULES FOR DISCUSSION STUDY
Utterances are defined as "the linguistically meaningful message that a person speaks during conversation" (Nofsinger, 1991). Operationally, use the following rules to unitize each speaking turn:

- Always break an utterance at "yes" or "yeah" or "no" or "OK"
- Do not break an utterance at "oh"
- Break utterances before "because"
- Break utterances before "and" and each item in an ordered list (e.g., "Go buy bread, milk, and cheese."
- When a subject is engaged in verbal fumbling, code the meaning of the message and not the poor verbal structure
- When there is a statement within a statement (e.g., I’m going to.. Are you OK? …buy a new car.), break the statement apart into three statements (first half of first statement, then second statement, then second half of first statement)
- Always break an utterance at "and stuff" "and/or something like that" "or whatever" "and so forth."
- Do not break an utterance at "well."
- Break utterances before "because of" in a complex sentence.
- Break utterances before "if" in a complex sentence (e.g., If you ask questions, /the teacher will help you.), but do not break it in a simple sentence (e.g., I'm just wondering if this committee is going to have any luck.)
- Do not break an utterance before "and" when "and" is in a phrase. (e.g., "time and time again" or "a hundred and fifty years", "north of Broad and High.")
- For "like" "that" "which" "who" "when" "where" "no matter what" "until" "nor" "or", just act at your best sense.
- But if there are a series of those terms in a sentence, please break each of them into an utterance. (e.g., I went to school with kids who couldn't read /nor write, who done drugs, who know how to steal, but can't read /nor write.)
To unitize the discussion transcripts into utterances, simply place vertical ( | ) lines between utterances in a given speaking turn. These vertical lines will indicate the break between two utterances in a given speaking turn. Then, once all utterances in a given speaking turn have been separated, count and write in the number of utterances identified in the speaking turn to the right of the speaking turn. (Note: the number of utterances in a speaking turn is NOT equal to the number of lines you have drawn, so be sure to count each and every utterance in a speaking turn.) Thus, two speaking turns that have been fully unitized would look like this:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Seat</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>5</td>
<td>&quot;I totally agree with you on the fact that it does need adjustment on the mentality of people,</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3</td>
<td>&quot;That’s ****.</td>
</tr>
</tbody>
</table>