PUBLIC OPINION IN THE SOCIAL MEDIA ERA: TOWARD A NEW UNDERSTANDING OF THE SPIRAL OF SILENCE

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We the undersigned, certify that we read this thesis and approve it as adequate in scope and quality for the degree Master of Arts.

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ABSTRACT

This thesis explores the intersection of a long-standing public opinion theory – the spiral of silence – and the recent explosion in social publishing tools such as Tumblr and Twitter. It uses real-world discussion settings (including face-to-face focus groups and synchronous online discussions) in tandem with a pre-test/post-test methodology to measure opinion shifts on the topic of corn syrup and childhood nutrition/obesity. This research design is based on well-established criticisms challenging that the spiral of silence may not be fully explained by a national climate of opinion on a topic, suggesting that there are other influences on individual beliefs than just popular opinion. This thesis investigates the role of social media on opinion-forming variables, the role of the social publishing platforms themselves on opinion-forming variables and the manifest application of the spiral of silence within these environments. The hypotheses were not supported by the research and did not yield statistically significant variance, but statistically significant patterns emerged that demonstrate the need for further research in this area that builds on the research methodology across a more extended time span.

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CHAPTER 1: INTRODUCTION

Importance of the Study

Social media tools such as Twitter and blogs have made a profound impact on mass media in the United States. In the last year alone, society has been witness to a swell of new blogs and media influencers while traditional media outlets in major cities have suffered cutbacks or outright liquidation (Blankenheim, 2009). This trend will no doubt have a permanent effect on the face of mass media in this country, but as the effects of these changes proliferate one must consider the impact of social media on public opinion and the shaping of an individual's social decision-making environment. At the same time, longstanding theories about public opinion – such as the spiral of silence – are challenged by this new media environment and the behaviors associated with individual interaction within it. This thesis will explore the impact of these changes on the longstanding spiral of silence theory while providing a fresh perspective on the forming of public and individual opinion in social media environs.

Statement of the Problem

Social publishing tools consist of a unique communication medium framed in the construct of computer-mediated communication. They include consumer-generated content on sites such as YouTube and Twitter as well as the proliferation of personal and professional blogs. By their very nature, these tools are subject to a profound lack of traditional social context cues (Griffith, 2009), and increase the instances of anonymous activity. This creates a compelling new set of challenges for traditional communication theory and theorists, particularly Noelle-Neumann's spiral of silence (Noelle-Neumann, 1984). As she put forth in the theory, Noelle-Neumann believed that the process of opinion forming and sharing was based on one's

perceptions of popular opinion, and that perceptions of decreasing support for one's position led to a reduced likelihood in speaking out about the topic (Noelle-Neumann, 1977).The impact of computer-mediated communication has been applied against the spiral of silence theory in the past (McDevitt, 2003) but the specific impact of social media and citizen journalism on individual opinion-forming has not been tested. Additionally, a detailed understanding of the intersection of the spiral of silence theory with social publishing and social media holds potential for unearthing how that medium influences individual opinion. Based on a review of existing literature, there is a dearth of empirical studies that assess how human behavior on the Internet can drive opinion-forming in the self and others, and how various social media environments impact that behavior.

The Spiral of Silence theory has been studied extensively from a variety of perspectives. The theory itself is not without its detractors, although the nature of the criticisms and the recommendations these critical studies make for research in this area actually establish a compelling landscape of research opportunity. This thesis will expand on those criticisms and drive further understanding of the theory by examining it from the new perspective of social publishing.

Definition of Terms Used

Social Publishing Tools: Internet-based self-publishing platforms that enable all individuals to share and consume content free of editorial and other filters. Examples: Tumblr, YouTube, Blogger, Twitter and Digg.

Social Decision-Making Environment: The social media environment that a user encounters online. This environment is comprised of both a technology and a communication medium; that is, it is a mediated communication environment.

Blog Site: An online content site consisting of a series of journal entries, published by an individual or media entity. online content site published by an individual or media entity for broad consumption. For purposes of this thesis, refers to the actual end-user experience versus the technology platform (e.g., refers to the blog and its content versus the Blogger or Tumblr publishing technology).

Synchronous Online Discussion: An online discussion environment that is real-time and immediate, and all users are present. Distinguished from other online discussion forums like discussion boards and listservs, where conversation is asynchronous and ongoing over sometimes extended periods of time.

Organization of Remaining Chapters

This thesis is organized into five chapters. Chapter two deals with a review of existing literature in the field of study and sets out the hypotheses. Chapter three describes the scope and methodology for the study and contains an overview of assumptions and hypotheses. Chapter four contains a review of data from the study and discussion of the findings, and compares those findings against the original hypotheses. Chapter five summarizes the thesis and discusses limitations and further recommendations for study in this area.

CHAPTER 2: LITERATURE REVIEW

This literature review examines two primary areas of research relevant to this topic. First, it examines the relevant history of the spiral of silence theory as a contextual backdrop for the arguments put forth in the proposed research hypothesis. Then, it examines recent research on the context of computer-mediated communication and its effect on the spiral of silence, examining weaknesses in research methodology and scope and opportunities for improved learnings.

Theoretical Basis

The spiral of silence theory was first published in 1973 by Elisabeth Noelle-Neumann and is grounded in more than two decades of primary and investigative research that built on 200 years of research and understanding about public opinion and influences (Noelle-Neumann, 1977, p. 64). Her research – framed around *the hypothesis of silence* (p. 1) – is both a cultural criticism and a scientific pursuit of understanding. The longstanding theory construct on which she based her research is framed around four principles:

1. People covet popularity, and fear being ostracized for their beliefs.
2. People observe the environment around them constantly to avoid conflict and improve popularity.
3. There are variations on the strength of one's belief – a concept she refers to as "liquid" and "solid" belief conditions.
4. Perception of increased support for one's position leads to increased outspokenness on the issue by the individual (Noelle-Neumann, 1977).

Noelle-Neumann's theory was initially tested in the context of German political elections, a theme replicated frequently in subsequent studies by both Noelle-Neumann and later researchers. As a result, the theory is often thought of as a political communication theory, when

it was intended by Noelle-Neumann to be applicable to all instances of mass media theory and research (Anderson, 2006).

The Literature

The spiral of silence theory is not without its detractors and criticism of the theory is leveled in three distinct categories (Scheufele and Moy, 2000). The first of these questions whether fear of isolation is sufficient enough grounds to discourage speaking out on a topic. The second criticism questions the external validity of the Asch conformity experiments common to early empirical studies of the theory (Glynn & McLeod, 1985, Price & Allen, 1990, Salmon & Kline, 1985) which are not of concern for this thesis. Of the three categories of criticism, it is the third that is of the most interest for this work. This category challenges that the spiral of silence may not be fully explained by a national climate of opinion on a topic, suggesting that there are other influences on individual beliefs beyond popular opinion (Glynn & Park, 1997). This study will serve to advance understanding about this last category of criticism, addressing both understanding of the spiral of silence and the emerging role of social publishing as an influence on opinion.

One such criticism that warrants examination for our purpose here studied the tendency towards political outspokenness against the spiral of silence. The theory itself states that people will forego doing the right thing in favor of doing the good thing, good being defined as "that which does not isolate one socially" (Lasorsa, 1991, p. 132). Lasorsa's criticism is leveled plainly at perceptions of the role of mass media in the spiral of silence, that they represent a constant rather than a variable. In fact, Lasorsa argues that media is indeed a variable, and he designed his research around that concept (Lasorsa, 1991). His hypothesis confirmed within the limited scope of his study that media is indeed a variable point of influence and does not retain

characteristics of a constant input. Importantly, the study was conducted 25 years ago in only in one city which makes it a good historical study, but one must question its applicability in today's fragmented media environment.

A prime example of this misdirected intent lies in a follow up paper published by Noelle-Neumann in 1979. In that study, she replicated the conditions of her initial research using a different sample population and topic, focusing on perceptions about the death penalty. In that paper she references The Federalist writings of James Madison, lending further credibility to the applicability of her theory on a political science context (Noelle-Neumann, 1979). The direction of Noelle-Neumann's research had a lasting impact on research topics that later tested her theory. Part of her rationale for constructing research in this manner is the belief that topics must be morally loaded in order to invoke strong test of the spiral of silence (Perry & Gonzenbach, 2000), and politics are a common area of focus for this type of research.

One such study by Taylor tested the spiral of silence against another public opinion theory, pluralistic ignorance (Taylor, 1982). This is an interesting study to consider in the context of social media, particularly the context of his five hypotheses. The most compelling of his hypotheses suggests that those who favor a majority position tend to believe that there is an increasing trend of support towards it.

It is this fourth hypothesis that is of concern with for the purposes of this study, as the ability for individuals to seek support for their position via social publishing tools could lead to a self-edited version of reality that represents perceptions of greater support for one's position. What is interesting about this hypothesis was that the research conducted by Taylor failed to confirm its validity, particularly among those who hold minority viewpoints. This would provide support for the hypothesis that the majority of support on an issue is self-determining, and those

in the minority of support on an issue are self-limiting. However, this study was conducted more than 20 years ago in a very different mass media environment and, social publishing tools notwithstanding, might test remarkably different in today's media climate. Independent of the issue tested against – a variable for which the potential statistical anomalies cannot be discounted – mass media today looks very different than its 1982 counterpart.

Another study of interest examined the impact of reference groups on the shaping of opinion among individuals (Oshagan, 1996). The study particularly focused on a theory revision published by Noelle-Neumann (1995) which put forth the concept of the spiral of silence as a social control. As Oshagan writes, "in this view, society achieves consensus by using the power of public opinion to threaten deviant individuals with social isolation, thereby effecting control over individual expressions" (Oshagan, 1995 p. 335). His findings were compelling, particularly in the context of social publishing tools, as they cast doubt on the role of society as a whole in the process of forming individual opinions. Indeed, Oshagan's findings supported the hypothesis that reference groups may play a larger role in forming one's opinions than perceptions of larger social patterns and beliefs (1995 p. 350). This may have particular bearing on the hypothesis of this proposed research, as the impact of reference groups should be much higher among creators and consumers of social publishing tools due to the heightened ability to share content and nearly limitless opportunity for locating like-minded individuals, thus creating a self-edited reference group.

One specific aspect of the spiral of silence worth examining for the purposes of this proposed research is the concept of isolation. Neuwirth, Frederick & Mayo (2007) studied the concept within the context of communication apprehension literature. Their findings generally support the spiral of silence theory, particularly the focus on an individual's fear of isolation

based on their beliefs, and was studied in recent media climate that may be more conducive for social publishing. Still, the topic measured against in their study – US elections – is one that evokes strong feelings. While consistent with Noelle-Neumann's original works in politics, it may be worth considering a multi-variant test using a variety of topic measures so as to not introduce a false fear of isolation based on the strong opinions on one specific topic.

One compelling finding focused on the constructs of past spiral of silence studies. The spiral of silence theory is written to predict not speaking out, while many studies are focused specifically on the outcomes of speaking out on a topic. This misses the more passive individuals who choose to not admit their position on a topic – particularly a sensitive topic as some of those measured here – and discounts the possibility of a large number of individuals remaining silent on an issue (Neuwirth, Frederick & Mayo, 2007). This is worth considering in the design of new research on the spiral of silence.

Reference groups are an important part of the spiral of silence theory, as studied by Oshagan (1996). A related area of study germane to the proposal of this research is the impact of small group face-to-face communication on the spiral of silence theory. While social publishing takes place wholly outside the realm of face-to-face communication, the nuances of impact face-to-face has on the spiral of silence could provide some interesting parallels or areas to explore further in this proposed research. Price & Allen (1990) put forth the importance of small group communication on the spiral of silence. They write, "public opinion is not always, as Noelle-Neumann sometimes implies, a cultural or moral norm with sufficient consensual validity to crush any who dissent. Such consensus must grow out of disagreement, debate, argument" (Price & Allen, 1990, p. 388). They go on to write that this consensus need not result in social conformity, a key aspect of Noelle-Neumann's theory. Indeed, this provides an interesting

backdrop for the study of social publishing tools and citizen journalism – if self-edited reference groups provide individuals with a modicum of trust in the strength of their opinions, that could potentially have implications for consideration.

A second study in small group communication focused on the face-to-face aspects of opinion forming, and the ability for individuals to have their beliefs strengthened through participation in face-to-face deliberation of an issue (Burkhalter 2002). This is a variation on the hypotheses put forth by Taylor (1982) that was tested to be true – that individual's beliefs are strengthened when they believe their opinion matches that widely held by society. This has potential implications for social publishing, as the medium fundamentally enables an individual to state their beliefs in a given topic, seek support and "followers" for that position while at the same time bolstering their own perception that their position is held by others. This needs to be fully tested in a non face-to-face setting, as the implications may not test to be valid in computer-mediated communication.

Meta-analyses of spiral of silence research have yielded some interesting points to consider. Research conducted as of 1997 found a small but statistically significant confirmation of the spiral of silence (Glynn, 1997). Another meta-analysis confirmed the need for more macro-studies of the theory, as opposed to hyper-focused studies utilizing small samples and morally charged topics (Scheufele & Moy, 2000).

The bevy of research published on the spiral of silence presents an overwhelming case for the need for research in this area. This paper examines the intervening role of the Internet on the core construct of the spiral of silence and it is therefore relevant to examine the published research that connects the theory to the foundational knowledge of computer-mediated communication. This connection could potentially serve to illustrate the differences between the

face-to-face communication and that based on the relative anonymity of the Internet, and potentially helps connect the contribution and impact of computer-mediated communication on the theory.

Computer-Mediated Communication and the Spiral of Silence

The need for further research in this area is well-illustrated by the lack of available and current research on the intersection of the spiral of silence and computer-mediated communication. Part of studying the spiral of silence requires us to understand how people gather and interpret information (Jeffres, Neuendorf & Atkin, 1999), how their personal opinions are shared, and predictions about how the advent of new technologies might impact the theory and the shaping of opinion. Although few studies have been conducted specifically in this area, there are two of vital importance to this thesis.

Research in computer-mediated communication addresses the nature of how humans interact with other humans via a third (digital or Internet-based) intermediary. In general, computer-mediated communication studies the addition of the computer as an intermediary machine, examining the impact of this non-verbal and non-visual medium on interpersonal communication (Thurlow, Lengel & Tomic, 2004). As mentioned earlier, there is one recent study that directly examined the impact of computer-mediated communication on the spiral of silence theory (McDevitt, 2003) but the specific impact of social media and citizen journalism on individual opinion-forming has not been tested, and as described elsewhere this study has its limits.

Published research in this area dates back only ten years, due, no doubt, to the nascent nature of technologies underwriting the need for exploration. The oldest study, published in 1997, found that at the time, “media coverage does not always reveal a clear direction or pattern

of public opinion, especially with electronic news media that regularly provide short reports and sound bites without much background information" (Lin & Salwen, 1997 p. 140). This same concept arguably applies today to social publishing, and the complaint has been lodged by all facets of society – that blogs are unsourced and not credentialed journalists and therefore not trustworthy, that information found on Twitter is based on second-hand and not primary sources of information, and so on.

The first of these two studies focuses specifically on the role of social-psychological influences in computer-mediated and face-to-face communication. Their findings are of particular interest as they confirmed that Noelle-Neumann's predicted fear of isolation was attenuated by computer-mediated communication, supporting the notion that social publishing may establish opportunities for individuals to express opinions far afield from mainstream and reach out to others who seek the same (Ho & McLeod, 2008). The findings of Ho & McLeod further support the hypothesis that the lack of social context cues increases the social dynamics via computer-mediated communication, and supports egalitarianism in reference groups.

The study is not without its flaws, however. While it was conducted recently – and therefore takes into account the current mass media landscape as well as the general nature of new social publishing technologies – the study was conducted wholly among undergraduate students at a major university. This group may not serve as a proxy for society at large as it self-selects for increased Internet usage and might skew the usage patterns that dictate consumption patterns of the media. The other aspect of the study that raises concern is the topic measured against, particularly in the context of the sampling population of undergraduate students. The study was organized around the topic of same-sex marriage equality and rights. While this aligns with Noelle-Neumann's belief that the morally charged topics make a stronger case for the spiral

of silence (Perry & Gonzenbach, 2000), the combination of the sampling population and topic might question the applicability of the study design to a larger population. A more comprehensive sample would be necessary to confirm the findings of Ho & McLeod.

The second study worth examining focused on the advent of interactive media providing improved access to political content and related effects on civic participation (McDevitt, Kiousis & Wahl-Jorgensen, 2003). The strength of this study lies in the fact that it is the first spiral of silence research to be conducted without asking questions – that is, removing the variable of passivity (Neuwirth, Frederick & Mayo, 2007) by examining actual conversation in an online chat setting. The findings of the study supported the notion that positions taken by individuals publicly – or, in the case of the study, online – may not match exactly their personal opinions. This study did not find a link to disinhibition or increased likelihood of speaking out on a fringe topic; in fact, there was no statistically significant difference between face-to-face and computer-mediated communication. This would lend criticism to the hypothesis that social publishing enables self-edited reference groups and, therefore, greater gatherings of individuals around positions that might not be popular opinion. Nevertheless, the study was conducted 6 years ago, and circumstances do change. Technology has evolved since the study was completed, and vast numbers of new individuals have come online and begun using social publishing tools.

Literature Review Summary

Significant research has been conducted since Noelle-Neumann wrote the first constructs of the spiral of silence in 1973 and studies have tested both the fundamentals of the theory as well as its applicability to a variety of communications mediums. No strong support for the theory emerges from the studies – indeed, many cite statistically significant but not overwhelming support for the theory (Glynn, 1997). Still, the theory has amassed significant

interest among social science researchers and existing research supports at least enthusiasm for the concept. Little research is published that examines computer-mediated communication in the context of the spiral of silence theory, and there are no published research articles that test social publishing or citizen journalism against the theory. A few key points that must be kept in mind when considering proposed research in this area is the need to test morally loaded topics (Perry & Gonzenbach, 2000), and to consider building on the research methodology established McDevitt, Kiousis & Wahl-Jorgensen (2003) to study within the medium, versus posing a series of questions out of context.

The other aspect of the spiral of silence that must be addressed is the treatment of mass media in the research design. Noelle-Neumann's original construct suggested that mass media is a constant public opinion influence, referring to a journalist's "uniform rules of selection." This original construct element was later challenged (Lasorsa, 1991) to confirm that mass media reflect a variable point of influence. Hypothetically, the role of mass media is further weakened by the groundswell in social publishing leading to a fragmented distribution of media influences on public opinion. As a result, the role of gatekeeper long established through published research is reduced and individuals are increasingly thrust into that role for themselves.

Hypotheses

This research leads to three primary hypotheses for this study that further the limited computer-mediated communication studies of the spiral of silence theory. This study will also make use of the best-known research approaches for studying this theory by using morally-loaded topics studied within the context of the medium itself, replicating true human behavior.

H1: Access to content via social publishing platforms – specifically, blogs and online content platforms such as Tumblr – drives fragmentation in opinion-forming variables and result in increased outspokenness by those hold minority opinions.

H2: The increased anonymity of social media – specifically, online chat environments – encourages holders of a minority opinion to express their position more freely than the face-to-face counterpart.

H3: This fragmentation and freedom of expression challenges the Spiral of Silence construct and requires individuals to take on more of an editor-based role in the selection of influences that drive their opinion-forming.

CHAPTER 2: METHODOLOGY

The expanse of research that tests various attributes of the spiral of silence provides a complex backdrop against which to prepare this research methodology. Many of the studies rely on quantitative deductive research designs sampled in a college population. The methodology selected for this study is a randomized experimental study that replicates the research design of McDevitt, Kiousis & Wahl-Jorgensen (2003). That methodology was selected as it reproduced a real-world discussion scenario to induce realistic conversation between participants within the medium in question. In the pursuit of understanding about the spiral of silence and for the purposes of this study, one should generally accept the logic that replacing hypothetical opinion variables with actual discussion and interaction should result in a more relevant and real-world findings.

Additionally, it is clear from the established body of knowledge that the ability of researchers to observe and measure social publishing behavior is improved by increasing the synchronicity – or real-time – discussions about a topic between participants. This study used that construct to study opinions with simple pre and post-test results. Further, it used the medium of social publishing (blogs, Twitter, YouTube, etc.) to test information uptake and the impact of that content on the opinions of participants by establishing control and test groups. Therefore, this study consisted of four groups of randomly selected individuals each to provide a bivariate approach; two of the groups participated in online discussions and two participated in real-world discussions. One group from each discussion setting was given access to a series of socially published and online materials prior to the discussion, while the remaining two groups were not given such information. Thus, the research strives to establish a linkage between how individuals collect information online and the impact of that on their opinion-forming. This linkage is

intended to be identified in part by contrasting the behavior of the experimental groups with that of the control group who will receive no access to information. All discussions were pre-tested and post-tested via a brief online survey to establish perceptions of the topic and understand the impact and usage of social publishing on the topic.

Sample

By extrapolating, the intent of this study is to establish opinion-forming patterns in the population at large. To achieve this in a defensible manner, we must be able to draw comparisons not only between online and offline behavior, but among a sample that proves reliable and truly representative of society. Many past studies have established patterns of behavior among college students (Ho & McLeod, 2008, McDevitt, Kiousis & Wahl-Jorgensen, 2003). While it provides a convenient sampling population, it challenges the defensibility of this study for two reasons. First, one can make the assumption that given the demographics of many social publishing sites, students are a self-selected group who may have a higher usage percentage of social publishing sites and therefore skew the study's findings. Second, the research seeks to test the practicality of the proposed hypotheses in real world settings. College students reflect one aspect of that reality, but to be defensible the study must be inclusive of all participants who may take place in debate.

Therefore, the research focused on four groups as described. Each group was limited in size to 8 members to take advantage of known best practices in group communication settings (Hoyle, Harris & Judd, 2002, p. 401). The groups were sampled randomly from a database of research participants. The database was comprised of individuals who had opted-in and self-selected as being interested in market research and/or focus groups. The researcher contacted the chosen participants – clarifying his role as an independent researcher not working in affiliation with any group or organization. As a matter of process, the researcher had e-mail and telephone

access to this database of interested research participants. Upon selection and assignment into one of the four control or test groups, each participant was individually invited to participate in the selected exercise via personalized e-mails and offered a modest $25 honorarium for their time. The database consists of more than 1,500 names pre-registered who are interested in participating in market research and studies and are pre-qualified to fit a wide variety of demographic criteria. One known limit of the database is the limited Los Angeles-area geography. For the purposes of this study, it is not believed that this had a meaningful or statistically significant outcome for the study.

From that base population a table of random numbers was used to determine a sample population who received e-mail invitations to participate in a market research discussion about the assigned topic (described in the *Procedure* section, below). As group members were recruited for the four distinct groups, this sampling was repeated until an appropriate increase in the number of invitations reaches the desired sample population of four groups consisting of eight members each.

Instrumentation

As mentioned elsewhere, this study was designed to use discussion around a morally-charged topic – childhood obesity and the corn syrup industry – to measure research patterns in social publishing and the impact of that on opinion-forming and sharing.

Using a brief analysis of existing media coverage, Internet-based discussion and review of third-party nutrition/wellness expert commentary, it was believed prior to the pre-test that the established **majority** opinion was that corn syrup is detrimental to children's health, and the established **minority** opinion was that corn syrup has a negligible or insignificant role in children's health. Findings about the tonality of public opinion on this topic are of secondary

interest in this study and serve solely as a contextual backdrop for the construct of the study. The results of the pre-test served to reconfirm the validity of the assumed majority/minority opinions.

The instruments for this research were designed for the explicit purposes of this study. More than 25 potential topics of discussion – all of which meet the criteria of being morally-loaded – were assessed before arriving at the final topic at random via blind selection. The research instruments themselves were designed to encourage participant interest in the topic and were intended to appear as a legitimate market research survey.

The test procedures began with a Likert-scaled pre-test of opinions on the topic and some basic demographic data as described in the procedure section. This established across the four groups – test and control – basic awareness of corn syrup's connection to childhood obesity and informed the research as to existing popular opinion. This information was critical to measuring the outcomes of the stated hypotheses.

The next phase of instrumentation for this test involved driving test group participants to an online micro-site on the Tumblr platform. This site was published in the form of a blog with blog posts and related social content (YouTube, etc.). The blog posts themselves vary in tonality on the core issue – childhood obesity – but were framed in the perceived majority opinion that corn syrup is detrimental to childhood health and obesity, The control group received no such links or information prior to the study.

Two synchronous online chat sessions were scheduled via WebEx – one for the control group and one for the test group – during which a moderator welcomed the eight participants and lead them in conversation about the topic. The moderator used a series of questions designed to stimulate online chat and drive opinion-sharing.

Two face-to-face meetings were also scheduled – one for the test and one for the control – during which the same questions were posed to the groups for consideration in an effort to drive conversation and discussion. The sessions were recorded for experience monitoring, but an analysis of this type could potentially considered for future research of this type to uncover qualitative findings about opinion-forming that fall outside the scope of this research.

A post-test followed all discussions to measure the outcome of opinions on the topic and, for the test group, the impact of the social publishing site content provided to them in advance of the sessions. Pre- and post-test surveys were distributed via the Internet to designated participants via SurveyMonkey.

Procedure

Consistent with the tests examined in the literature review and with Noelle-Neumann's established theory, to induce the most valid aspects of the spiral of silence a research topic should be based on a morally-loaded topic (Perry & Gonzenbach, 2000). As this has a cultural grounding and is unique to a time and potentially a geographic point of reference, the researcher chose a topic that has received recent media attention and has two well-established groups on opposing sides (a pro-corn syrup trade group on one side, and an anti-corn syrup pro-consumer group on the other). For the purposes of this study it was assumed that this established "right vs. wrong" or "pro vs. con" context provided a morally-loaded backdrop of content knowledge. As stated elsewhere, this research is not focused on the outcomes of perception on this issue, per se; it is a vehicle useful for measuring opinion-forming. The quantitative findings of the discussion settings are not of consequence to the research for this study and will not be evaluated. This medium is proposed merely as a vehicle for opinion expressing and exploration.

This chart outlines the testing methodology for the four experimental groups for further consideration.

Research Group	Pre-Test Variables	Opinion Influences	Post-Test Variables	Hypothetical Outcome
Online Discussion – Test Group (Social Publishing)	Pre-test to determine awareness of issue, self-reported usage of social publishing tools.	Blog site published by research group. Synchronous online discussion with peers led by moderator.	Post-test determined usage of blog site, changes in perceptions about issue.	Uptake of blog site content will impact perceptions on issue and encourage formation of opinions in support of its position. Minority opinions equally voiced.
Face-to-Face Discussion – Test Group (Social Publishing)	Pre-test to determine awareness of issue, self-reported usage of social publishing tools.	Blog site published by research group. Synchronous focus group discussion with peers led by moderator/facilitator.	Post-test determined usage of blog site, changes in perceptions about issue.	Uptake of blog site content will impact perceptions on issue and encourage formation of opinions in support of its position. Interpersonal social cues discourage minority opinions.

Research Group	Pre-Test Variables	Opinion Influences	Post-Test Variables	Hypothetical Outcome
Online Discussion – Control Group	Pre-test to determine awareness of issue, self-reported usage of social publishing tools.	Synchronous online discussion with peers led by moderator. No information given ahead of group discussion.	Post-test determined changes in perceptions about issue.	Pre-formed opinions – not influenced by content from test group – remain consistent, but minority opinions given voice.
Face-to-Face Discussion – Control Group	Pre-test to determine awareness of issue, self-reported usage of social publishing tools.	Synchronous focus group discussion with peers led by moderator/facilitator.	Post-test determined changes in perceptions about issue.	Minority opinions remain unvoiced.

Once participants were selected and identified, the testing procedure for this experiment spanned two weeks from pre- to post-test findings. As described in the chart above, the control groups received no instructions or information about the topic at hand beyond what was contained in the pre-test survey.

The test group, conversely, was provided with a complete micro-site of information published by the researcher, complete with a variety of social publishing content examples including blog posts and consumer-generated content (YouTube, Twitter, etc). The micro-site was built on the open Tumblr content-aggregation platform and comprised as much as possible of "create your own adventure" content to the extent that participants were able to take advantage of links from articles they find interesting to other pieces of content that reinforce the same points. This method replicates the construct of the hypothesis that in social publishing

mediums, people begin to create for themselves a sense of reality as they perceive it which is a self-reinforcing phenomenon.

Validity

Construct Validity

The research focus of experimental studies that test the spiral of silence theory have been widely criticized for their construct validity, particularly as they induce to the spiral of silence a variable of passivity that are not reliable in real-world settings, and do not reflect realistic communication environments (Neuwirth, Frederick & Mayo, 2007). These factors challenge the ability for the studies to reach their needed insights. The strength of this study design lies in the fact that it tests within the medium that we are measuring, thereby providing a direct application of the technology to the process of opinion-forming.

This study also gathers a number of constructs of disinterest, namely in the form of insights on the topic being used to seed debate among participants in the study and cross-tabulated statistics related to demographics and group make-up. Additional potential insights could be gleaned through observation techniques; as these are not the core focus of this research and fall outside the scope of the researcher's expertise, such insights will be discarded as both an ethical and a practical measure.

Internal Validity

This research design was comprised of research instruments that induce high internal validity due to the rigorous pre-test/post-test methodology. Nevertheless, as referenced in the Limitations of the Study, this research was founded in the formation of public opinions which are subject to shaping based on group dynamics. Although these behavioral group dynamics are of

secondary interest to the study, they fall outside the scope of direct research technique in this research design.

External Validity

In designing this experimental research it has been taken into consideration the need to make use of the mediums described – social publishing – to induce high external validity applicable to society at large, versus abstract theory that requires further investigation to qualify. There are several potential challenges to the external validity of this research of concern:

1. Impact of the chosen topic on the group dynamics. The topic chosen for this study – childhood obesity and use of sweeteners – may invoke varying levels of passion among group participants. While the researcher is cognizant of this and contends that this is applicable to larger social context cues, it remains a concern that concern (or lack of) for the topic by the chosen participants will skew results in one direction or another.

2. Lack of real world setting. As much as possible, this research design made use of the chosen medium to invoke opinion-forming behaviors with group participants and influence decision making that impact hypothesis analysis. Still, it needs to be understood that the a limit of this study lies in its outright inability to measure reality as a whole; any experimental design is inducing artificial intelligence to research design and also risks skewing external validity. This is not, as such, a natural forum for the expression of opinions from the participants and it improves upon past studies, remains a valid consideration in the framing of results.

3. Geography. The participant pool for this chosen study is based in the Los Angeles metropolitan area, a requirement for the in-person group exercise in the research

design. It is the belief of the researcher that nutrition awareness in large metropolitan areas may skew in a high awareness direction thereby affecting the external validity of this study. As stated, this research is not concerned with the outcomes of opinions on the topic per se; it is a secondary construct. After reviewing a long list of potential topics – all of which fall under the general requirement of being morally loaded (Perry & Gonzenbach, 2000) – a topic was selected that will produce a valid test topic for the geographical environment.

CHAPTER 4: THE STUDY

Data Analysis

All data from this study was gathered using discrete SurveyMonkey instruments in pre-post fashion. Survey instruments were customized to each study group but comprised of the same measures and questions to provide the most reliable results. Each study group consisted of eight randomly-selected individuals who completed the entire study, keeping the demographics in each study the same in the pre- and post-test environments. No significant demographic differences were recorded among the four study groups. For the two test groups, a question was added to the post-test survey to confirm that they had received and reviewed the corn syrup content on the blog site and all participants confirmed. Data was gathered over a two-week period in March, 2010 among participants in the Los Angeles, Calif. Metropolitan area. Basic notes were kept by the focus group moderators about discussion times for various moderation questions that were used to guide analysis of the research (for example, correlating a heavily debated topic with its associated survey questions).

Results of the Study

Opinion data was compared between studies to investigate associations relevant to the hypotheses. Survey questions were framed around the concept of current corn syrup "hype" and based on current press coverage about the effects of corn syrup on childhood nutrition and contribution to obesity in America. These questions were written in a controversial tone by design. Initial topic research that indicated the majority opinion on the topic – that corn syrup is detrimental to children's health – and the minority opinion – a belief that corn syrup is a neutral

or negligible effect on children's health – were both confirmed by the pre-test results and established the foundation for analysis of shifts in sentiment in the post-test results.

The Online Discussion – Test Group

Findings from the pre-test for this group indicated a weak majority opinion but supported belief or awareness of the corn syrup hype (Figure 1, below). There were no clear indications of a strong minority opinion held by any member of this test group. In the post-test analysis, the already weak minority opinions were virtually eliminated and exposure to the Tumblr blog content appeared to have little effect on the outcomes of opinions in this group. Additionally, participation in the online chat did not result in a strong dialogue from either majority or minority opinion holders.

The Face-to-Face Discussion –Test Group

Findings from the pre-test for this group demonstrated a strong majority opinion with a single-person minority outlier countering the popular beliefs. The post-test revealed a clear absence of the minority opinion which would indicate a shift in opinion. It is not clear from the data gathered whether this shift was driven by exposure to the online content on Tumblr or the face-to-face discussion setting, but the spiral of silence was reinforced in either scenario.

The Online Discussion – Control Group

Pre-test sentiment in the online discussion – control group group's was a centrist and weak majority opinion void strong positions on either the top-two or bottom-two box. The post-test did not reveal any significant shift in opinions about the topic; existing opinions were reinforced and reconfirmed among the group. No evidence of the spiral of silence was present in the post-test results which were otherwise unremarkable.

Face-to-Face Discussion Control Group

The final group had a strong majority opinion evident in the pre-test with high awareness and support for corn syrup hype. There was no evidence of a strong or vocal minority opinion. The post-test results indicated a notable shift in opinions or beliefs on a controversial question – "Food manufacturers should be banned from using corn syrup in snacks targeted to children." Bottom two-box support shifted from 0% in the pre-test to 37.5% in the post-test. Analysis of this trend indicates that a vocal minority voiced their beliefs, backed up with data and compelling arguments, to the discussion panelists and convinced them of her/his position. While this challenges the spiral of silence construct, it is a single episode in a limited sample size and should only be interpreted as an area for further research. It is interesting to note, however, that this shift only happened among the control group that received none of the published information and in a face-to-face discussion setting, where the original theoretical construct would suggest that the spiral of silence should be at its strongest. In fact, in the face-to-face test group, minority opinion on the topic was absent from the research findings and the findings were unremarkable.

All Hype-Affirmative Statements (Figure 1)

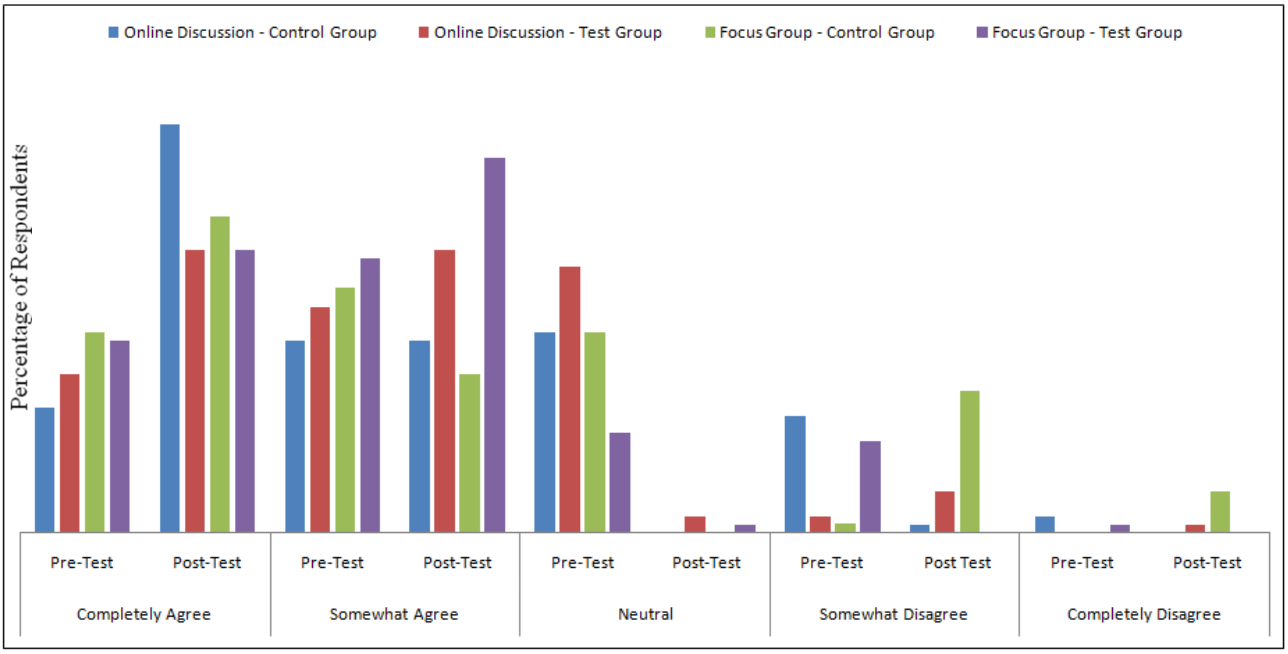

Table 1	**Completely Agree**		**Somewhat Agree**		**Neutral**		**Somewhat Disagree**		**Completely Disagree**	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Online Discussion - Control Group	19%	67%	29%	32%	31%	0%	18%	1%	3%	0%
Online Discussion - Test Group	24%	45%	34%	45%	40%	3%	3%	7%	0%	1%
Focus Group - Control Group	31%	48%	37%	24%	31%	0%	1%	22%	0%	6%
Focus Group - Test Group	29%	43%	41%	56%	15%	1%	14%	0%	1%	0%

Figure 1 visualizes the emergence of a strong minority among the Focus Group – Control Group (in green) in the post-test environment, reinforced by the data in Table 1. Figure 1 also indicates a clear shift to majority opinion among the other test groups, as well as the elimination of the minority opinion among the Online Discussion – Test Group and Focus Group – Test

Group participants. In all cases, “Neutral” responses were essentially eliminated in the post-test which indicates the forming of clear opinion.

Two controversial survey questions elicited lengthy discussion during all focus groups. The first (“Food manufacturers should be banned from using corn syrup in snacks targeted to children”, Figure 2) resulted in a polarizing discussion about regulation of the food industry and voicing of all opinions, majority and minority alike. The post-test results indicated a concomitant polarization in opinion on the topic, including development of a strong minority opinion in three groups. One exception – the Focus Group – Test Group – eliminated its minority opinion entirely in the post-test indicating a potential application of the spiral of silence.

Food Manufacturers Should Be Banned From Using Corn Syrup In Snacks Targeted To Children (Figure 2)

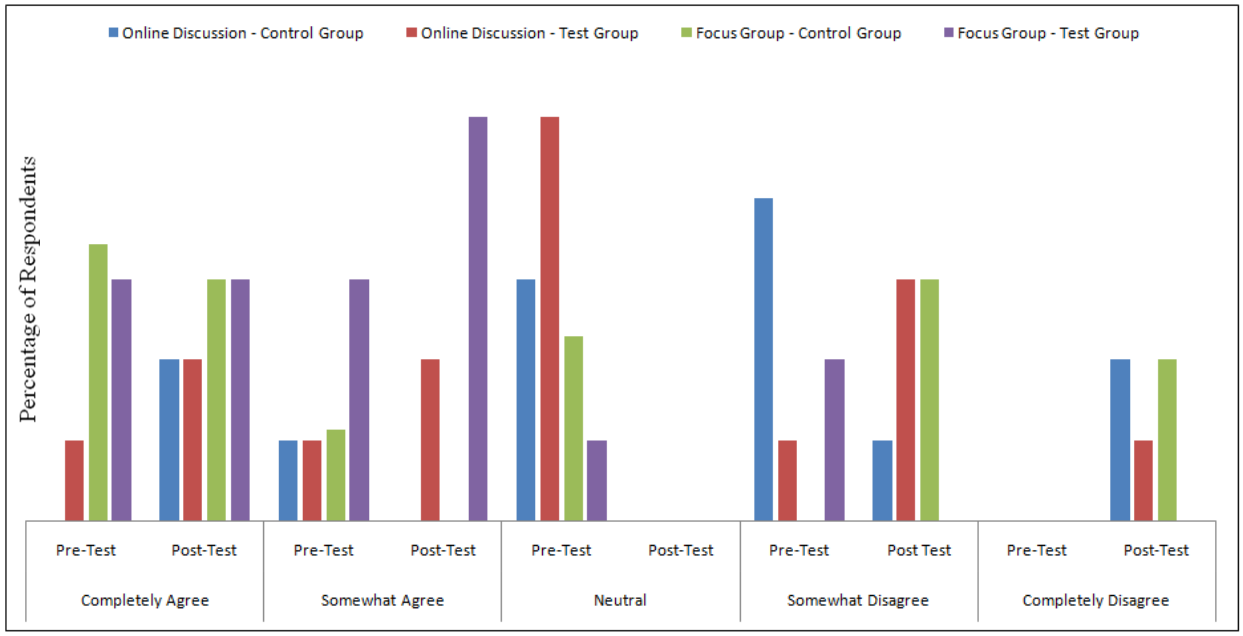

Table 2	Completely Agree		Somewhat Agree		Neutral		Somewhat Disagree		Completely Disagree	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Online Discussion - Control Group	0.0%	25.0%	12.5%	0.0%	37.5%	0.0%	50.0%	12.5%	0.0%	25.0%
Online Discussion - Test Group	12.5%	25.0%	12.5%	25.0%	62.5%	0.0%	12.5%	37.5%	0.0%	12.5%
Focus Group - Control Group	42.9%	37.5%	14.3%	0.0%	28.6%	0.0%	0.0%	37.5%	0.0%	25.0%
Focus Group - Test Group	37.5%	37.5%	37.5%	62.5%	12.5%	0.0%	25.0%	0.0%	0.0%	0.0%

Similarly, a second survey question ("Children in American consume too much corn syrup," Figure 3) elicited a strong and polarizing debate during discussions among all four groups. However, this did not appear to have a substantial resulting impact on public opinion.

Children in American Consume Too Much Corn Syrup (Figure 3)

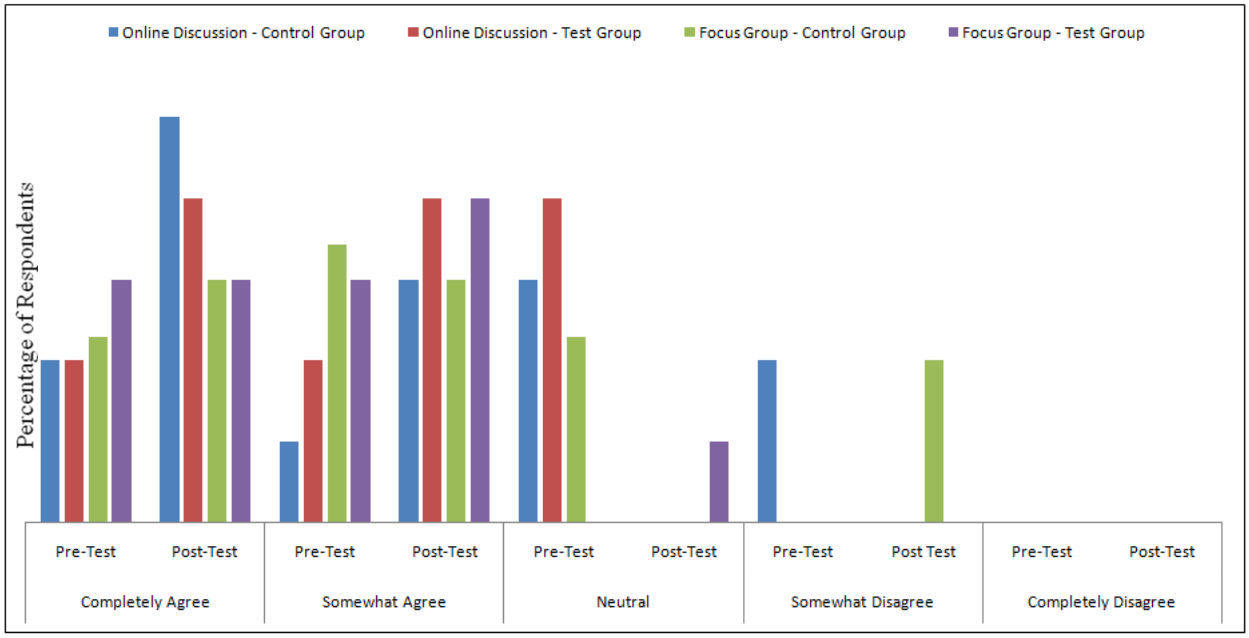

Table 3	Completely Agree		Somewhat Agree		Neutral		Somewhat Disagree		Completely Disagree	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Online Discussion - Control Group	25%	62.5%	12.5%	37.5%	37.5%	0%	25%	0%	0%	0%
Online Discussion - Test Group	25%	50%	25%	50%	50%	0%	0%	0%	0%	0%
Focus Group - Control Group	28.6%	37.5%	42.9%	37.5%	28.6%	0%	0%	25%	0%	0%
Focus Group - Test Group	37.5%	37.5%	37.5%	50%	0%	12.5%	0%	0%	0%	0%

Figure 3 follows a similar form to Figure 1, with the Focus Group – Control Group being the outlier study group that formed a strong minority opinion in the post-test. The complexity of discussion around this topic during the focus groups did not otherwise lead to a cogent shift in opinion.

Study Demographics		Online Discussion - Control Group	Online Discussion - Test Group	Focus Group - Control Group	Focus Group - Test Group
Gender	Male	42.9%	50%	62.5%	50%
	Female	57.1%	50%	37.5%	50%
Age	18-24	14.3%	25%	12.5%	0%
	25-34	0%	12.5%	0.0%	12.5%
	35-44	28.6%	25%	25%	62.5%
	45-54	28.6%	37.5%	25%	12.5%
	55-64	14.3%	0%	25%	12.5%
	65 or Above	14.3%	0%	12.5%	0%

Study Demographics

The age and gender demographics captured during the pre-post instruments indicated general age parity among the test groups, with a modest anomaly among the Focus Group – Test Group which skewed slightly younger than the other three groups. Gender was at parity among the groups. It is not perceived that these minor differences contributed to study outcomes.

Discussion

It is helpful in framing the findings of this study to reexamine the original hypotheses posed. Overall, the post-test results were unremarkable and did not support the hypotheses, but did indicate the beginnings of trends and patterns that warrant further study. Additionally, there is limited evidence to support the logic that the spiral of silence is altered by the nature of social media environments. This weak link is further supported by the findings of the one of the study groups – the Focus Group – Control Group. This group did not receive any published information about corn syrup hype and came into the discussion with just their own opinions and beliefs about the topic. This resulted in a shift towards the minority opinion (Figure 1), particularly on controversial questions (Figure 2). Surprisingly, no other groups including the

two test groups exhibited similar tendencies. No other factors including demographics would appear to have affected the makeup or outcomes of this group.

Hypothesis	**Hypothesis**	**Outcome**
H1: Do opinion-forming variables in social media environments – specifically, online chat – impact the outcome of a discussion?	Individuals in social media environments will be more likely to share their position on an issue and potentially recruit others to their opinions.	No clear connection made on this. Hypothesis not supported by findings.
H2: Do social publishing platforms – specifically blogs and online content platforms such as Tumblr – impact the forming of opinion?	Broad availability and quality of online blog content impacts opinion-forming of individuals more than other mediums.	Test groups did appear to strengthen support of corn syrup "hype". Hypothesis supported to some degree.
H3: Do social publishing and social media environments support the spiral of silence theory - specifically, that individuals are more free to express a minority opinion in social media environments?	By comparison to face-to-face environments, individuals holding a minority opinion will be more likely to recruit others to their position online than in-person.	Hypothesis not supported. In fact, face-to-face group had more success recruiting participants to minority opinion than online discussions.

CHAPTER 5: SUMMARIES AND CONCLUSIONS

Limitations of the Study

The threats to the internal validity of this study stem from natural differences in group-forming dynamics and the associated impact on both the independent and dependent variables in the study. In truth, this threat is a natural component of the spiral of silence and illustrates the wide variance in individual personality and group communication dynamics. Each test or control was conducted among only one group and should be replicated with additional groups in the future to derive more objective findings. Additionally, the limited sample size in each group resulted in the demonstration of patterns and trends, but was insufficient for a full analysis of that data to derive outcomes against the hypotheses.

External validity threats included the impact of the topic chosen to frame the study. The research was designed to use real-world discussion environments and a topical discussion category (corn syrup and childhood nutrition) to spark a vibrant group discussion. In reality, the chosen topic can cause a wide variance in participation. A second threat to external validity arose from not using real-world settings to frame the discussion. As the discussions and research design are an artificial communication environment, communication behavior may be impacted. Lastly, the participant pool was chosen from individuals living in the Los Angeles metropolitan area and could skew both understanding of the chosen topic as well as the group-forming behaviors.

Future Study Recommendations

The research design for this thesis is intended to be easily replicated by future research teams to enable further research and discovery of the spiral of silence theory. To overcome the threats to internal and external validity, future studies should include multiple groups within each

test and control group, and pull participants from varying geographies and backgrounds. Future research should increase the size of each group to improve internal validity.

Additionally, selection of a topic should take into account the criticisms of the original spiral of silence theory – namely, that there are other influences on an individual than just the national climate of opinion on a topic. Thus, topics such as politics might have less household awareness or topical knowledge than a topic like childhood obesity or religion. Future studies should span a longer period of time and study shifts in opinion over time on the topic to achieve the most reliable results.

An additional alternative for study would be to include both synchronous and asynchronous discussion environments, and multiple social publishing platforms. Cross-tabulating the impact of each environment should yield more decisive results that either support or rebut the spiral of silence theory.

Conclusion

Overall, this study was designed to take a fresh and scientific approach to studying the intersection of the spiral of silence and social publishing environments, while using a research design cognizant of the criticisms of the empirical studies of the theory. Ultimately, while the beginnings of some trends and patterns emerged from the study, overall the research did not support the hypotheses in a statistically significant way. There was little variance between the control and test groups for either online or in-person discussions, and it was not confirmed that the Tumblr blog impacted perceptions or opinions about the chosen topic. There was limited evidence to support the hypothesis that social publishing platforms alter opinions on a topic, but further research would be needed to assess the comparative impact of traditional media versus social publishing to determine the relevance of this finding to the spiral of silence. As a result,

there is limited evidence to support the logic that the spiral of silence is altered by the nature of social media environments. This alternate research methodology bolsters critics of the spiral of silence by demonstrating the complexity of measuring and assessing public opinion over a period of time in real-world settings.

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APPENDIX

Appendix: Pre-Test Results	Agree Completely	Agree Somewhat	Neutral	Disagree Somewhat	Disagree Completely
I am familiar with the basic food pyramid.	OC: 12.5% OT: 25% FC:12.5% FT: 37.5%	OC: 87.5% OT: 37.5% FC: 50% FT: 62.5%	OC: -- OT: -- FC: 37.5% FT: --	OC: -- OT: 37.5% FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I understand the basic principles of the food pyramid and healthy diet.	OC: 12.5% OT: 25% FC: 12.5% FT: 37.5%	OC: 87.5% OT: 37.5% FC: 50% FT: 62.5%	OC: -- OT: -- FC: 37.5% FT: --	OC: -- OT: 37.5% FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I believe children's snacks are aligned with food pyramid guidelines.	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: 25%	OC: 37.5% OT: -- FC: 12.5% FT: --	OC: 25% OT: 50% FC: 62.5% FT: 25%	OC: 37.5% OT: 50% FC: 25% FT: 50%
I believe children's snacks are unhealthy.	OC: 25.5% OT: 25% FC: 25% FT: 37.5%	OC: 62.5% OT: 25% FC: 37.5% FT: 37.5%	OC: 12.5% OT: 37.5% FC: 37.5% FT: 12.5%	OC: -- OT: 12.5% FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I am familiar with corn syrup as a food ingredient.	OC: 12.5% OT: 25% FC: 28.6% FT: 37.5%	OC: 75% OT: 25% FC: 28.6% FT: 37.5%	OC: 12.5% OT: 50% FC: 42.9% FT: 12.5%	OC: -- OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I believe corn syrup is unhealthy.	OC: 12.5% OT: 25% FC: 42.9% FT: 25%	OC: 50% OT: 37.5% FC: 28.6% FT: 50%	OC: 25% OT: 37.5% FC: 28.6% FT: 12.5%	OC: -- OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I believe sugar is unhealthy.	OC: 12.5% OT: 25% FC: 28.6% FT: 12.5%	OC: 50% OT: 50% FC: 42.9% FT: 62.5%	OC: 25% OT: 25% FC: 28.6% FT: 12.5%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I believe America has an obesity crisis.	OC: 25% OT: 25% FC: 28.6% FT: 37.5%	OC: 37.5% OT: 37.5% FC: 42.9% FT: 37.5%	OC: 25% OT: 37.5% FC: 28.6% FT: 25%	OC: -- OT: -- FC: -- FT: --	OC: 25% OT: -- FC: -- FT: --
I believe children in America are less healthy than other countries.	OC: 25% OT: 25% FC: 28.6% FT: 37.5%	OC: 37.5% OT: 37.5% FC: 28.6% FT: 37.5%	OC: 25% OT: 37.5% FC: 28.6% FT: 12.5%	OC: 12.5% OT: -- FC: 14.3% FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I think natural sugar is healthier than corn syrup or high fructose corn syrup.	OC: 12.5% OT: 25% FC: 14.3% FT: 12.5%	OC: 37.5% OT: 37.5% FC: 57.1% FT: 50%	OC: 25% OT: 37.5% FC: 28.6% FT: 25%	OC: 12.5% OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I believe there is a connection between corn syrup and obesity.	OC: 25% OT: 25% FC: 28.6% FT: 37.5%	OC: 25% OT: 50% FC: 42.9% FT: 37.5%	OC: 25% OT: 25% FC: 28.6% FT: 12.5%	OC: 25% OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I believe that children's snacks made with corn syrup are unhealthy to consume.	OC: 25% OT: 25% FC: 28.6% FT: 37.5%	OC: 12.5% OT: 25% FC: 42.9% FT: 12.5%	OC: 37.5% OT: 50% FC: 28.6% FT: 25%	OC: 25% OT: -- FC: -- FT: 25%	OC: -- OT: -- FC: -- FT: --
Children in America consume too much corn syrup.	OC: 25% OT: 25% FC: 28.6% FT: 37.5%	OC: 12.5% OT: 25% FC: 42.9% FT: 37.5%	OC: 37.5% OT: 50% FC: 28.6% FT: --	OC: 25% OT: -- FC: -- FT: 25%	OC: -- OT: -- FC: -- FT: --
Food manufacturers should be banned from using corn syrup in snacks targeted to children.	OC: -- OT: 12.5% FC: 42.9% FT: 37.5%	OC: 12.5% OT: 12.5% FC: 14.3% FT: 37.5%	OC: 37.5% OT: 62.5% FC: 28.6% FT: 12.5%	OC: 50% OT: 12.5% FC: -- FT: 25%	OC: -- OT: -- FC: -- FT: --
I buy snacks made with corn syrup and am aware it is an ingredient.	OC: 25% OT: 12.5% FC: 28.6% FT: 25%	OC: 12.5% OT: 37.5% FC: 42.9% FT: 50%	OC: 37.5% OT: 50% FC: 28.6% FT: --	OC: 25% OT: -- FC: -- FT: 25%	OC: -- OT: -- FC: -- FT: --

I might buy snacks made with corn syrup, but am not sure.	OC: 12.5% OT: 12.5% FC: 28.6% FT: 12.5%	OC: 25% OT: 37.5% FC: 57.1% FT: 75%	OC: 37.5% OT: 37.5% FC: 14.3% FT: 12.5%	OC: 25% OT: 12.5% FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I am not worried about corn syrup's effect on childhood health.	OC: 12.5% OT: 12.5% FC: 14.3% FT: 12.5%	OC: 12.5% OT: 37.5% FC: 57.1% FT: 62.5%	OC: 37.5% OT: 37.5% FC: 28.6% FT: 12.5%	OC: 37.5% OT: 12.5% FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --
I believe corn syrup is linked to a bad diet.	OC: 25% OT: 25% FC: 28.6% FT: 12.5%	OC: 12.5% OT: 25% FC: 28.6% FT: 50%	OC: 37.5% OT: 37.5% FC: 42.9% FT: 12.5%	OC: 25% OT: 12.5% FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: 12.5%
I do not see a difference between corn syrup and sugar; it is all equally bad.	OC: 12.5% OT: 25% FC: 28.6% FT: 37.5%	OC: 25% OT: 50% FC: 28.6% FT: 37.5%	OC: 37.5% OT: 25% FC: 42.9% FT: 12.5%	OC: 25% OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: -- FT: --

1. Indicates one or more respondents skipped the question

Key

OC: Online Discussion –Control Group

OT: Online Discussion – Social Publishing Test Group

FC: Face-to-Face Discussion – Control Group

FT: Face-to-Face Discussion – Social Publishing Test Group

Appendix: Post-Test Results	Agree Completely	Agree Somewhat	Neutral	Disagree Somewhat	Disagree Completely
I am familiar with the basic food pyramid.	OC: 75% OT: 25% FC: 62.5% FT: 12.5%	OC: 25% OT: 75% FC: 37.5% FT: 87.5%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I understand the basic principles of the food pyramid and healthy diet.	OC: 75% OT: 25% FC: 62.5% FT: 12.5%	OC: 25% OT: 75% FC: 37.5% FT: 87.5%	OC: -- OT: -- FC: -- FT: --	OC:-- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I believe children's snacks are aligned with food pyramid guidelines.	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 12.5% FT: 25%	OC: 25% OT: 37.5% FC: 25% FT: 25%	OC: 75% OT: 62.5% FC: 62.5% FT: 50%
I believe children's snacks are unhealthy.	OC: 75% OT: 50% FC: 62.5% FT: 12.5%	OC: 25% OT: 37.5% FC: 37.5% FT: 87.5%	OC: -- OT: 12.5% FC: -- FT: --	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I am familiar with corn syrup as a food ingredient.	OC: 62.5% OT: 50% FC: 75% FT: 25%	OC: 37.5% OT: 50% FC: 25% FT:75%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --
I believe corn syrup is unhealthy.	OC: 62.5% OT: 50% FC: 50% FT: 50%	OC: 37.5% OT: 50% FC: 25% FT: 50%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 25% FT: --	OC: -- OT: -- FC: -- FT: --
I believe sugar is unhealthy.	OC: 62.5% OT: 50% FC: 50% FT: 50%	OC: 37.5% OT: 50% FC: 25% FT: 50%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 25% FT: --	OC: -- OT: -- FC: -- FT: --
I believe America has an obesity crisis.	OC: 62.5% OT: 50% FC: 62.5% FT: 50%	OC: 37.5% OT: 50% FC: 12.5% FT: 50%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 12.5% FT: --	OC: -- OT: -- FC: -- FT: --
I believe children in America are less healthy than other countries.	OC: 62.5% OT: 50% FC: 37.5% FT: 50%	OC: 37.5% OT: 50% FC: 25% FT: 50%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 25% FT: --	OC: -- OT: -- FC: 12.5% FT: --
I think natural sugar is healthier than corn syrup or high fructose corn syrup.	OC: 75% OT: 50% FC: 50% FT: 50%	OC: 25% OT: 50% FC: 37.5% FT: 50%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 12.5% FT: --	OC: -- OT: -- FC: -- FT: --
I believe there is a connection between corn syrup and obesity.	OC: 62.5% OT: 50% FC: 37.5% FT: 37.5%	OC: 37.5% OT: 50% FC: 37.5% FT: 62.5%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 12.5% FT: --	OC: -- OT: -- FC: 12.5% FT: --
I believe that children's snacks made with corn syrup are unhealthy to consume.	OC: 62.5% OT: 50% FC: 50% FT: 37.5%	OC: 37.5% OT: 50% FC: 25% FT: 62.5%	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: 25% FT: --	OC: -- OT: -- FC: -- FT: --
Children in America consume too much corn syrup.	OC: 62.5% OT: 50% FC: 37.5% FT: 37.5%	OC: 37.5% OT: 50% FC: 37.5% FT: 50%	OC: -- OT: -- FC: -- FT: 12.5%	OC: -- OT: -- FC: 25% FT: --	OC: -- OT: -- FC: -- FT: --
Food manufacturers should be banned from using corn syrup in snacks targeted to children.	OC: 25% OT: 25% FC: 37.5% FT: 37.5%	OC: -- OT: 25% FC: -- FT: 62.5%	OC: -- OT: -- FC: -- FT: --	OC: 12.5% OT: 37.5% FC: 37.5% FT: --	OC: 62.5% OT: 12.5% FC: 25% FT: --
I buy snacks made with corn syrup and am aware it is an ingredient.	OC: 25% OT: 37.5% FC: 62.5% FT: 37.5%	OC: 25% OT: 50% FC: 12.5% FT: 37.5%	OC: 12.5% OT: -- FC: -- FT: --	OC: 37.5% OT: -- FC: 25% FT: --	OC: -- OT: 12.5% FC: -- FT: --

I might buy snacks made with corn syrup, but am not sure.	OC: 25% OT: 50% FC: 25% FT: 37.5%	OC: 12.5% OT: 37.5% FC: 37.5% FT: 62.5%	OC: 12.5% OT: -- FC: 12.5% FT: --	OC: 50% OT: -- FC: 25% FT: --	OC: -- OT: 12.5% FC: -- FT: --
I am not worried about corn syrup's effect on childhood health.	OC: -- OT: -- FC: -- FT: --	OC: 12.5% OT: -- FC: -- FT: --	OC: -- OT: 25% FC: 37.5% FT: --	OC: 50% OT: 62.5% FC: 12.5% FT: 25%	OC: 37.5% OT: 12.5% FC: 50% FT: 75%
I believe corn syrup is linked to a bad diet.	OC: 50% OT: -- FC: 62.5% FT: 25%	OC: 50% OT: -- FC: 12.5% FT: 75%	OC: -- OT: 25% FC: -- FT: --	OC: -- OT: 62.5% FC: 12.5% FT: --	OC: -- OT: -- FC: 12.5% FT: --
I do not see a difference between corn syrup and sugar; it is all equally bad.	OC: 75% OT: 62.5% FC: 87.5% FT: 37.5%	OC: 25% OT: 37.5% FC: -- FT: 62.5%	OC: -- OT: -- FC: 12.5% FT: --	OC: -- OT: -- FC: -- FT: --	OC: -- OT: -- FC: -- FT: --

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