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Janell C. Walther

University of Nebraska-Lincoln, jwalther2@nebraska.edu

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TRANSFORMATIVE ENGAGEMENT IN DELIBERATIVE
DEMOCRACIES: EXPLORING A FRAMEWORK FOR ENGAGEMENT
USING A CREATIVE, BRAIDED APPROACH

by

Janell C. Walther

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TRANSFORMATIVE ENGAGEMENT IN DELIBERATIVE DEMOCRACIES:
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Janell C. Walther, M.A.

University of Nebraska, 2013

Advisor: Damien Smith Pfister

Policymakers, scientists, academics, and organizational leaders have long been interested in the best way to engage, persuade, and educate stakeholders, no matter the topic (e.g., Mazer, 2013; Bell et al, 2013). While exploration of information dissemination and presentation is growing (Jones, 2013; Gutkind, 2005), particularly within highly mediatized networked societies (Castells, 2008), the necessity for engaging, persuading, and educating citizens in the public sphere through diverse approaches is increasingly obvious. In particular, it is important and relevant to creatively engage stakeholders and decision-makers in an interactive dialogue to allow for fuller understanding about complex topics, especially in the realm of science and technology. At a policy level, it is valuable to engage the public through narrative techniques to debate or support new policy issues and create an atmosphere of transparency and dialogue (Jones, 2013).

In this thesis, I explore the use of narrative—specifically, creative nonfiction—in engaging publics in participatory deliberation and discussion to see how public engagement is affected by the presentation of different kinds of evidence. I examine how individuals and groups make sense of complex scientific topics, through both deliberation and feedback, when stimulated by creative nonfiction. This thesis looks to generate creative methods of increasing stakeholder knowledge and engagement with scientific concepts in participatory, deliberative settings through a comparative study using both deliberation insight and feedback from stakeholders to evaluate types of evidence presentation. Environmental sustainability science provides an important area for exploration, since it is both complex and polarized in the public sphere (Kahan, 2012). As science and technology policy decisions become increasingly central in public life, best practices

for engaging the public sphere in deliberative decision-making are accordingly necessary. This thesis presents a sustainability science controversy through both creative nonfiction and newsletter accounts in order to engage individuals in deliberative discussion and to gather feedback about engagement.

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CHAPTER 1. PROJECT RATIONALE

Public opinion is at the heart of modern democracies. Given the accelerating complexity of administrative institutions and the growing number of policy decisions related to environmental issues, the need to facilitate reasoned public opinion through a range of engagement strategies is crucial. In the last two decades, the study of public engagement has been vivified due to the rising use of public deliberation forums. Yet, a challenge persists: how might facilitators of formal public deliberations capture individual and collective attention? The present study seeks to understand how to capture the attention of the public and engage the public in deliberation and dialogue through the use of narrative, specifically, creative nonfiction about environmental science.

The Significance of Public Deliberation

Much research has detailed the benefits and difficulties of public deliberation, often called public engagement, citizen engagement, or democratic deliberation (see, for example, Bohman, 1996; Delli Carpini et al, 2004; Sunstein, 2005). Evolving from the Greek deliberative rhetoric of Aristotle's time (Majone, 1989), public participation and deliberation is a necessary foundation of democratic government (Bohman, 1996; Couldry et al, 2007). Bohman (1996) defines public deliberation as "a dialogical process of exchanging reasons for the purpose of resolving problematic situations that cannot be settled without interpersonal coordination and cooperation" (p. 27). Public deliberation is thus a valuable way of understanding societal implications and perspectives on a broad range of scientific, ethical, social, and policy issues (PytlikZillig & Tomkins, 2011). Gastil et al (2000) describes deliberation as a multi-step process involving careful analysis and evaluation: deliberation includes "careful examination of a problem or issue, the identification of possible solutions, the establishment or reaffirmation of evaluative criteria, and the use of these criteria in identifying an optimal solution" (p. 22).

Deliberation, by encouraging the weighing of multiple sides through *dissoi logoi*, improves participants' critical thinking and decision-making prowess (Mitchell, 2010).

Deliberation is essential in creating policies that garner public buy-in and ownership. Bohman (1996) writes that "the deliberative process forces citizens to justify their decisions and opinions by appealing to common interests or by arguing in terms of reasons that 'all could accept' in public debate" (p. 5). Deliberation relies on reasoning through participant interpretation, discussion, and sense-making (Bohman, 1996). An advantage of deliberation is that it acts as a public activity that is not limited to like-minded citizens, and such public deliberation can improve the "political justification and decision-making by subjecting them to a range of possible alternative options" (Bohman, 1996, p. 26). As individuals reason and problem-solve with each other, they ideally generate solutions or recommendations that are acceptable to a broader audience.

Public Engagement and Attention

Many commentators observe that, given our digitally-mediated, networked, and fragmented society with multi-directional pulls on attention, capturing the attention of the public is an engagement problem that policy makers, scientists, and educators need to address (e.g., Castells, 2008; McGee, 1990; Sunstein, 2001). Reeve et al (2004) define engagement as "behavioral intensity and emotional quality of a person's active involvement in a task or set of activities" (p. 149). Interest in deliberation and engagement on complex science, technology, and environmental controversies is of particular significance in part because these controversies are so new and complex that there is an attention challenge for not only educators, but also scientists and policy makers. To illustrate this point, Couldry, Livingston, & Markham (2007) write that "[n]o amount of communication, however stylish and informative, will engage people in politics, unless they are paying attention, at least some of the time" (p. 3).

This is a new variation on an old theme. Early theorists of mass communication, too, speculated about the political impact of information access. Charles Horton Cooley (1897) wrote

that as media tools make information more available to persons and groups, people have a greater awareness of each other and the world around them. Like Cooley, John Dewey theorized that a well-informed public could adequately form and voice public opinion (Crick, 2009). On the other hand, Walter Lippmann (1927) stated that too much information was overwhelming for voters, that citizens could never digest all the information available to them, and that government decision-making should thus be left to the experts: “we shall misunderstand the need seriously if we imagine that the purpose of the publication can possibly be the informing of every voter....For the man does not live who can read all the reports that drift across his doorstep or all the dispatches in the newspaper” (Lippmann, 1927).

This classic debate about information, deliberation, and the public continues today. Lanham (2006) characterizes our contemporary society as operating on economies of information, as opposed to industrialism or agriculture, which changes the way in which individuals think about and understand their world. Like Sunstein (2001; 2006), Lanham describes a modern world of information abundance wherein attention and engagement, long thought of as “fluff” (information) has replaced “stuff” (materials) at the apex of human economic exchange. Sunstein (2001) argues that this growing information age provides a multitude of choices for information, so citizens react by filtering to get only the information that they want, which can have “potentially destructive effects of intense market pressures on both culture and government” (p. 14). Sunstein argues that part of this destructive effect is that people will filter out opinions and information that are opposed to their own opinions, which can lead to “excessive confidence” and “extremism” (p. 14). In this sense, individuals may shift attention to and from topics they like, affecting policymakers positively or negatively depending on the issue (Sunstein, 2001).

Networked communication, as opposed to broadcast communication, occurs when many interlinked information providers connect with each other, trading information between sources (Castells, 2011). Here, each participating entity can be considered both a source and an audience.

Castells (2011) argues “[w]hat characterizes the current technological revolution is not the centrality of knowledge information, but the application of such knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and uses of innovation” (p. 29). Mitchell (2010) warns that with the continued information overload, the new challenge is “sorting through ever-expanding mounds of evidence whose relevance on pressing decisions may not be immediately apparent” (p. 99). As such, for formal deliberations, it is necessary to explore ways to capture the attention of citizens so that they might engage in the deliberation at hand.

As an activity that can increase attention to and knowledge about a given topic, public deliberation lends legitimacy to policies by providing individuals with a voice and vehicle in the public sphere. While some worry that uncritically-arrived at public opinion may be questionable (Fishkin, 1991), deliberation sets a framework for individual and collective understanding (Delli Carpini et al, 2004). Majone (1989) characterizes public deliberation as an activity that “mobilizes the knowledge, experience, and interest of many people, while focusing their attention on a limited range of issues” (p. 2). Participants in deliberation can gain knowledge, change their attitudes, and influence others (Majone, 1989). By bringing together diverse individuals within a community, collective deliberation promises to yield a policy that is more representative of the participating public voices.

Putnam and Boys (2006) describe the metaphor of voice as “[bringing] together different orientations to the notion of speaking as a way of exerting power in organizational life” (p. 559). This metaphor acknowledges the dialectic of suppression and expression with regards to voice. Public deliberation must capture the voices of the diverse, participating public in order to draw in multiple opinions for robust episodes of collective reasoning (Bohman, 1996). The collective decision that emerges from public participation is viewed as creating more legitimate and superior policy decisions (Barnes et al, 2003). However, Barnes et al (2003) note that the equality of voice and participation may be limited by how participants are brought together, how

exclusionary participant groups are, and how competent the participatory groups are. Collective voice creates a forum for public understanding, leading to public opinion and engaged policy decisions – often leading to political capital gains. The present study explores how collective voice can be encouraged to increase engagement in public deliberation forums.

However, this idea of how to generate trusted public decisions and provide for collective voice in administrative decision-making is hotly contested. For example, Fishkin (1991) claims that the decision-making capability of the mass public is questionable, particularly in face-to-face deliberation. He argues instead that opinion polling can shed the uncertainties of face-to-face deliberation (e.g., emotions, attitude change, knowledge inequality) and provide a more quantitatively significant answer for gathering a steadier public opinion over time. Sunstein (2006) argues that the influence of public deliberation may only yield increasingly polarized individuals, either due to reaffirmation of beliefs from like-minded individuals or failure of the opposition to express opposing opinions. Sunstein (2006) observes “[w]hen most people are more likely to be wrong than right, the likelihood that the majority’s position will be wrong approaches 100 percent as the size of the group expands” (p. 219). Many of these criticisms of public deliberation can be addressed through smarter interaction design.

However, little public deliberation scholarship focuses on how interaction design shapes deliberations (Delli Carpini et al, 2005; PytlikZillig & Tomkins, 2011; Rowe & Frewer, 2000). There are, of course, theoretical assumptions that are presumed to be central to public deliberation. Bohman’s (1996) keys for effective deliberation include taking place in an open, respectful environment that avoids private, secret conversation. Lupia (2009) argues that the only key elements of public deliberation, particularly online, are the quests for attention and memory of the public. Public participation, however, does not always have to come in a formal, procedural environment. Often, citizens talk with each other to form opinions, make moral judgments, learn others’ opinions, understand policies, and discuss ideas (Delli Carpini et al, 2005; Habermas, 1991; Majone, 1989). In this way, public deliberation can be formal or informal in practice.

Majone (1989) argues that public deliberation has been “institutionalized” to a sort of parliamentary process to ensure an order and limit disruptions. Rowe and Frewer (2000) issue eight examples of existing public participation formats including: referenda, public hearings, public opinion surveys, negotiated rule making, consensus conference, citizens’ jury, public advisory committee, and focus groups. Public deliberation can occur in these more formal formats as Rowe and Frewer cite, but it can also occur in unstructured, informal environments such as online discussion boards (Bohman, 2004; Dahlgren, 2005). The present study focuses on formal deliberation by using focus group deliberation as a format for participation.

CHAPTER 2. CREATIVE NONFICTION & PUBLIC DELIBERATION

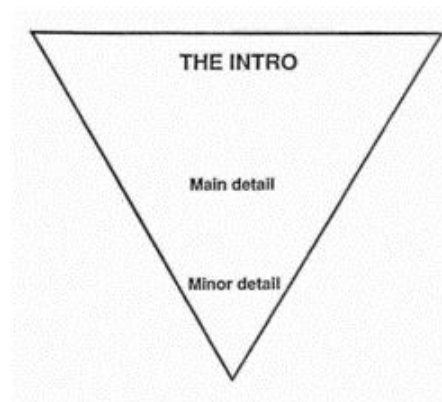
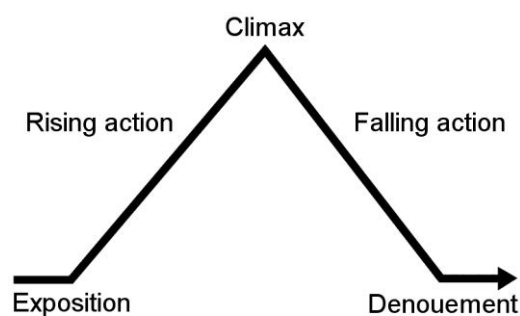
Public deliberation, evidence, and narrative have often been studied separately, but I integratively explore them by focusing on the role of narrative evidence in deliberative settings. Scholars in multiple fields of study are often interested in ways to persuade citizens in the public sphere. In this thesis study, I build on relevant historical and current research on the public sphere, deliberation, and evidence.

There is no one model of public deliberation noted for particular efficacy (Delli Carpini et al, 2004; PytlikZillig & Tomkins, 2011). Yet, public deliberation scholars have been calling for more formal deliberative venues to discuss science and policy issues (Raffensperger, 1998; Webler, 1998). This merits more academic consideration of “interaction design” in public deliberation. Deetz (2011) argues that all interaction is “designed.” He explains deliberation as “cooperative” and “co-determinative talk; aimed at determining what is true based on rationality, fact finding, appealing to common warrants, and procedures and removal of power dynamics” (p. 15-16). Interaction plays a role in deliberative democracy, which is “different from contemporary public discussions and argumentation because it focuses on a planned interaction process that attempts to overcome difficulties the public has in having good discussions” (p. 22). The focus on spurring deliberative democracies is an attempt to improve traditional public discussion and move beyond liberal democratic perspectives focused more on “person-centered or psychological...experience” (Deetz, 2011, p. 24). Given this approach, deliberations should acknowledge individuals’ need for and use of both rational and emotional communication in dialogue, deliberation, and decision-making. As such, it is important to study how to best reach individuals using an approach that bringing together the emotional and rational through narrative.

As previously mentioned, scholars must recognize the challenges in capturing attention in a new networked society (Pfister, 2009); one way to do so is for scholars of public deliberation to

study the role of narrative in engaging stakeholders. This focus on engagement and attention in public deliberation is especially important given the increased interest in science and technology communication and the growing prevalence of deliberative and participatory summits on such topics. Lee Gutkind, the “Godfather of Creative Nonfiction”¹ defines creative nonfiction as “factually accurate prose about real people and events—in a compelling, vivid, dramatic manner” (2005). The evidence within creative nonfiction is presented in a typical story arc format (see Figure 1) as opposed to the format of journalism or newsletters where information is presented in a top-down approach (see Figure 2) (PytlikZillig et al, 2013b). Creative nonfiction as a genre can include memoir, literary journalism, personal essays, or travel writing. While the genre is generally flexible in its definition, it does not include novels, journalistic articles, or short stories. The purpose behind creative nonfiction is “...to make nonfiction stories read like fiction so that your readers are as enthralled by fact as they are by fantasy” (Gutkind, 2005). In fact, Gutkind claims that “people remember facts ... better when they are embedded in a story” (2011).

Figure 2.1. Story arc format for creative nonfiction (1) and inverted pyramid format for journalism/ newsletter (2)



Gutkind conducted a study in which scientific scholars work together with creative writers in an effort to expand the publication of scientific information in more mainstream outlets such as literary journalism, memoirs, and experimental creative nonfiction formats in order to engage the public in relevant, scientific discourse. This experiment was a true exploration of

¹ Vanity Fair; see also: <https://www.creativenonfiction.org/authors/lee-gutkind>

combining narrative and science merged for the art of persuasion. The goal of such a study was to make science both relatable and engaging to the public sphere, meeting the public where they may interact easiest with scientists.² The first year of the experiment yielded a 50% publication rate, and some significant frustrations from the exploration of the traditionally polarized approaches, but Gutkind's team continued efforts to share science with the mainstream media (L. Gutkind, personal communication, April 25, 2013).

The application of narrative works beyond scientific engagement; narrative use is seen in reasoning and deliberation for many issues, particularly jury deliberation. A study by Pennington and Hastie (1986) sought to test the role of stories in jury deliberations hypothesizing that narrative is central to jury deliberation. This "Story Model" is made up of three facets: "evidence evaluation through story construction, decision alternative representation (verdict category establishment for the juror task), and story classification (selecting the verdict category that best fits the story based on the evidence)" (Pennington & Hastie, 1986, p. 249). In their study, Pennington and Hastie found that as individual jurors were asked to create stories regarding the evidence presented, the juror's stories were related to their verdict decision. However, the role of evidentiary evaluation was strong outside of story construction for some participants. In this thesis, I utilize the idea of the evidentiary story (creative nonfiction) as a way to present information to participants in a deliberation. To build on the deliberation data, I gathered feedback from the participants comparing and contrasting the two types of evidence (journalistic v. creative nonfiction).

Creative nonfiction may help to improve social and communicative engagement with science and technology at a policy level. In addition to decision-making, narratives can help win attention of the audience. Couldry et al (2007) argued that attention must be won before information can be shared, exploring ways in which to capture and maintain attention while sharing ideas and concepts is a central area of study. Because focus groups provide a captive

² See also: <http://www.youtube.com/watch?v=SiAGXqpaTuw>

audience by their opting in to the study initially, the present study gathers feedback about how participants engage specifically with the background evidentiary materials (both creative nonfiction and newsletter formats) and how they use the background materials in their deliberation. As a result, I contribute to the current literature by supplementing research in the fields of social and cognitive engagement, public deliberation, and narrative evidence analysis.

Creative Nonfiction and the Historical Literary Roots of the Public Sphere

The idea of a “public sphere” has long been debated. Habermas (1964) defined the public sphere as a “realm of our social life in which something approaching public opinion can be formed,” whether in ordinary daily interaction through formulation of a “public body” or as a creator of public opinion (p. 49). The public sphere works to hold governmental decisions accountable by creating a critical public (Habermas, 1991). The ideal of public reason was often seen as based on a bourgeois norm of communication, inaccessible to some publics (Habermas, 1991). Hauser (2007) later argued that new technology opens up the realm of the public sphere to a broader audience, particularly in the reduction of outside influence such as media or political authorities. Today, the public sphere still functions as a way of creating and judging public opinion.

G.T. Goodnight (1987) embraced the Habermasian perspective by theorizing how the norms of argumentation differed based on whether they emanated from the public, personal, or technical sphere. Goodnight (1997) described the personal sphere as one that occurs between people at a more intimate and private level featuring personal, open-ended conversation. The technical sphere is less open-ended, emphasizing expertise and scientific experimentation. The public sphere is grounded in public discourse, functioning to create knowledge or decisions transpiring from a specific time and place. These three spheres offer insight into human interaction and the ways in which public opinion is formed through intimacy (emotion), expertise (rationality), and interaction (discourse). These spheres are not necessarily mutually exclusive; as Pfister (2011) notes in the context of networked environments, the technical and public sphere

sometimes overlap, providing a site for expertise and public opinion formation to interact. This crisscross of spheres, through tools like creative nonfiction, can lead to better engagement.

The public sphere historically used literature as a way of making decisions; oral traditions shared mores and beliefs through stories such as parables, myths, or fables (Govier & Ayers, 2012). Research to date has shown that narratives help create individuals' opinions (Jones, 2013). The literary perspective expanded as consuming information grew easier at the turn of the century; as more individuals within society consumed information through newspapers and printed media, fewer individuals debated societal issues (Habermas, 1974). Mass media works to make literature available to a greater population, but this many-to-one, broadcast type communication merely creates a pseudo public (Habermas 1991). The public sphere has often been criticized for its bourgeois base (i.e., Asen & Brouwer, 2001; Goodnight, 1997; Habermas, 1991). On the other hand, Hauser (1987) argued that the very basis for the public sphere is that it is open to all citizens, and new technologies only work to expand the public sphere to a larger base (Pfister, 2011; Hauser, 2007).

Creative Nonfiction and Evidence in Contemporary Deliberation

Evidence is a key component in contemporary public deliberation (Mitchell, 2010). Majone (1989) wrote that evidence and presentation of evidence in deliberation is critical because “[e]ven a style of presentation that is inappropriate for the audience to which the argument is directed can destroy the effectiveness of information as evidence” (p. 63-64). In an evidence and media-saturated environment, evidence at deliberative engagements must help individuals make sense of and translate information without feeling overwhelmed (Mitchell, 2010; Pfister, 2009; Lanham, 2006). Freely (1996, as qtd in Mitchell, 2010) defined evidence as “...the raw material of argumentation... [consisting] of facts, opinions, and objects that are used to generate proof” (p. 100). Evidence may be a point of reference for individuals to generate their opinions, thus forming the base of public deliberation. Perez (2008) argues that the role of information sharing is of utmost importance in deliberative settings, writing that “the legitimacy of political decisions

depends on the quality of the information on which they are based” (p. 45). However, Perez warns that we must be mindful of not simply adding more information when individuals are already susceptible to information overload between increasing technology and increasing calls for transparency (see also, Sunstein, 2001; 2006). There is, then, the potential for a cognitive rift between the so-called “informed citizen” and the “real citizen.”

Pugh et al (2010) details ways to create transformative engagement in the classroom using evidence; applying similar tools for transformation in deliberative settings, particularly around science and technology issues, offer opportunities for stakeholder, policymakers, scientists, and others to capture the attention and interest of their desired audience. Discussion and deliberation can help shape the transformative experience of stakeholders. For example, Scott (1993) argues that rhetoric produces understanding and that meaning is made through conversation. Thus, creating a stimulating evidentiary conversation starter, like creative nonfiction, can lead to a more engaged public opinion.

Majone (1989) contends that deliberation forums must be wary of experimental presentations of evidence that may confuse or overwhelm participants. Specifically, he identifies problems when experts a) dress up their evidence through data and mathematics; b) create evidence that is too broad and difficult to assess; or c) sets standards for acceptable data too high. Majone’s warnings highlight evidence that focuses too heavily on rationality and expertise; at the same time, popularizing evidence to capture audience interest and attention may have pitfalls. Fahrenstock (1986) acknowledges that what the public often sees of science is that which is popularized, often in biology or medical findings that make their way into *The National Geographic*. She refers to these stories as “‘the wonder’ and ‘the application’ appeals corresponding to the deontological and teleological appeals in ethical argument” (p. 279). Fahrenstock argues that this may eliminate key elements of scientific interpretation, such as qualifiers and specific data. Such popularized evidence strays from the norms of scientific communication and argument (Fahrenstock, 1986). Despite Fahrenstock’s warning, science and

technology scholars and policymakers must work to gather public opinion in order to achieve legitimacy. Creative nonfiction offers a promising method to present facts in a manner that matches how individuals make sense of complex ideas.

Creative nonfiction as a method of presenting evidence is understudied despite the benefits and influence of narrative on decision-making. Jones (2013) argues that narrative plays an important role in how individuals and collectives form their opinions, particularly about climate science. At the same time, Jones illustrates that the field of studying narrative science is somewhat debated between both a humanities focus and a social science focus. Jones finds narrative to be influential on individuals' perceptions; however, his approach examines the use of a fictional evidentiary piece with factual elements rather than a creative nonfiction piece. Jones (2013) explains that stories or narratives are a "primary means" through which individuals make sense and communicate information (p. 7). In fact, some studies have found that as evidentiary information, "narrative messaging is more effective than scientific messaging" (p. 7).

At the same time, Kahan et al (2012) writes that peers and network relationships greatly influence individuals' opinions and perceptions. The broader question then becomes "can narrative evidence sway individuals more than social circles, or do social circles create narratives by which individuals make decisions"? A formal public deliberation looks to help participants foster opinions through deliberative means, allowing for movement in attitude and knowledge through the process (e.g., Bohman, 1996). The role of evidence, both scientific and social, must be examined to determine best ways to engage the public in deliberation. Although rationality is often thought to be at the root of public deliberation, there have been increasing calls for acknowledgement of narrative rationality, some particularly centered on presentation of evidence through narrative (Jones, 2013; Raffensperger, 1998; Torgerson, 1999). Just like emotions have been recognized in the role of human decision-making (Dietrich, 2013), so has the role of narrative. The debate over the "rational paradigm" vs. the "narrative paradigm" is one in which this thesis presents.

Rational Paradigm

The rational paradigm, according to Fisher (1984), assumes that humans are rational, decision-making beings. Argument and rationality are then determined by “subject matter knowledge, argumentative ability” as well as appropriate analysis and application (p. 4). The rational paradigm presupposes itself as epistemic (Fisher, 1984), though it is not simply based in science and mathematics but also the social sciences. The challenge with such a paradigm is in its assumptions – one cannot assume that humans are rational beings when emotions are also at stake (and they always are). Humans regularly make judgments, and democratic ones at that, based on emotion and personal experience. Likewise, many critics argue that rational argument is really a mask for the patriarchal logic of the White Anglo-Saxon Protestant (WASP) male population (Rowland, 1995). In contrast, Robert Rowland (1995) defended the rational paradigm arguing that instead of a truth in rationality, rather “knowledge and truth should be understoodas symbolic statements that function as useful problem-solving tools” (p. 354). Rowland argued that the rational paradigm is better understood as one of a pragmatic, effective problem-solving and evaluative tool.

The rational paradigm is not without its faults. For example, some political scientists support Rational Choice Theory, which, much like economic theories, posits that individuals make decisions based on weighing the costs and benefits to themselves (Ostrom, 1998). Like issues with Rowland’s rational paradigm, rational choice theory’s main fault is that it does not account for such “irrational” factors in decision-making such as social and emotional factors (Ostrom, 1998). Scientifically speaking, neurologists have found that emotions, often parlayed through narrative, have a deep impact on a cognitive and behavioral analysis (Bechara et al, 2000). The use of narrative then becomes a “useful fiction” in human reasoning, which makes it necessary to recognize that narrative has its place in a justice/democratic system as policymakers, politicians, and community leaders use this kind of reasoning to explain opinions, decisions, and recommendations (e.g. Gastil et al, 2002).

Narrative Paradigm

Walter Fisher (1984) claims that the use of the narrative paradigm in rhetoric combines both real and fictive worlds, using the rational and the narrative to produce both real and identifiable “modes of inference” and evaluation (p. 2). He argues that the narrative paradigm does not necessarily mean a fictive world, but instead a world wherein a composition is comprised of “symbolic actions” with a proper sequence (story) and co-constructed meaning. This narrative paradigm acknowledges the literary foundations of persuasion, by moving beyond formal argument and instrumental rationality. Fisher bases the paradigm on the following assumptions:

1. Humans naturally think in a narrative, story format
2. Human communication is part of the basis for decision-making
3. Human reasoning is based on contextual influence
4. Human rationality is in part by an ability to relate with stories
5. Human life is a story process³

Often, when considering our own judgment, we make considerations with regard to how we relate the situation to others and to ourselves (e.g., “putting ourselves in their shoes”) and drawing on a personal or relatable experience or story to help understand potential consequences, impacts, benefits, and relationships. The narrative paradigm must then be considered at the root of human action as a sense-making activity for humans – it is not simply a rhetorical tool, but a paradigm within which humans reason, communicate, explain, persuade, and describe. If we think and reason in terms of narrative, then we also process as rhetorical beings in a continuous process of decision-making and understanding that is both intrinsic and extrinsic.

In Fisher’s (1989) response to Rowland, he points out that the narrative paradigm is not rhetoric, but is instead the basis on which rhetoric may be built acknowledging that humans are narrative in nature. Narrative, too, can be epistemic. He argues that narrative is a basis for

³ Modified from Fisher, 1984, p. 7-8.

rhetorical, poetic, scientific, and philosophical genres of argument in that storytelling underlines the way in which humans communicate and construct meaning. Likewise, narrative is a basis for human cognitive thinking; educators and policymakers alike have explored the use of narrative to frame arguments for increases in both knowledge and influence (e.g. Nussbaum, 1995; Hinyard & Kreuter, 2007; Nisbet, 2009). For example, Govier and Ayers (2012) found that parables can assist in the construction of argument and vice versa. Building on narrative as a cognitive tool has shown increased knowledge that is positively linked to civic and political engagement with more action-oriented results and public acceptance (e.g. Lindenfeld et al, 2010; Jacobs et al, 2010). As such, combining conventionally conceived rational argument with narrative processes maximizes potential for change, particularly in deliberative settings.

Part of what makes narrative rationality work is that it captures individuals' emotional response alongside their rational response. Despite criticism of public deliberation and the missing influence of a public with, as John Dewey notes, lots of problems, the emotional and rational interplay of human beings can be vital to policymaking. In his book, *The Sentimental Citizen*, Marcus (2005) illustrated the role that emotions play in making policy decisions, arguing "emotions enable rationality" (p. 7). Dietrich (2013) writes "emotion is a state of feeling, but it encompasses physiological, cognitive and behavioral components" (p. 19). Emotion plays an important role in our decision-making and choices, as emotions help us evaluate decisions and situations. Marcus (2005) makes the case for emotion-enabled reason:

Emotions, by taking up successfully the tasks they perform, free the mind for what it does best; to deliberate, reflect, articulate, and reconsider the various course of action and justification that can be linked to the choices before us (p. 75).

Deliberation highlights emotion and passion through interaction with others, allowing for a communicative rationality that is made up of both emotion and reason.

Creative Nonfiction and the Third Culture

The sciences and the humanities have, since the onset of the modern age, steadily separated themselves from each other. However, with growing overlap between needed “experts” from science and technology in shaping public opinion and policy decisions, policymakers, academicians, and stakeholders must better understand the way in which these fields overlap in order to create an informed decision-making process. Following, this thesis study explores issues related to the use of expertise, the third culture, and environmental sustainability science.

Expertise. E.J. Hartelius (2008) argues that in our modern culture, individuals increasingly rely on experts to delegate authority in the name of efficiency. Yet, there is a shift from a singular expertise to a more networked expertise (Pfister, 2011; Hartelius, 2008). Decisions over exactly who is a credible, reliable expert come into play, just as the credibility and reliability of evidence are also of issue in deliberation. Often, decisions over the credibility of experts are made at the individual level, and these credibility decisions are often convoluted by competing messages (Hartelius, 2008). Mitchell (2010) claims that science creates a demand for rhetoric and that this “demand-driven rhetoric of science necessarily raises questions about what’s driving the demand” (p. 105). If participants in a deliberation are concerned about the experts at the table, their expertise is undermined by the concern over influence. These determinations of credibility create an issue with conflicts between experts and “ordinary citizens.” Grim (2005, as cited in Hauser, 2007) contends that experts and ordinary citizens have variant qualifiers for evidence, reasoning, and debate. Like Fahrenstock’s (1986) critique of science versus popularized evidence, so stands Grim’s argument about the related verification of expertise. We see this increasing fragmentation of expertise through networked media, as Sunstein (2001, 2006) fairly warns.

On the other hand, Majone (1989) argues for the interaction of experts and ordinary citizens, suggesting that it spurs more robust deliberation: the “dialectical confrontation between generalists and experts often succeeds in bringing out unstated assumptions, conflicting

interpretations of the facts, and the risks posed by new projects” (p. 5). In this sense, if experts can see how facts and assumptions may be interpreted (or misinterpreted), experts can consider context, relevancy, and experimentation in presentations of their expert opinions. Like Majone, Raffensperger (1998) claims that “[o]n too many occasions, the scientists are viewed as the experts who have everything to contribute while government agencies want the public to be quiet and accept the interpretation offered by the scientists. This results in bad science and bad policy” (p. 38). She found that the best policies originate when groups deliberate as equals, offering multiple, diverse opinions, questions, and analysis, much like Habermas and Hauser’s ideals of the public sphere. By creating an experimental expertise and public input, a public sphere that draws in technical expertise, but does not let it dominate, is formed.

Third Culture. It is a temptation to assume that public deliberation is entirely based on rational thought and rational decision-making, expecting that participants will make sense of uninterpreted facts. Understanding that humans are not entirely rational beings and that decisions are made using both emotions and narratives is a key component to understanding public deliberation (Marcus, 2005; Jones, 2013). This balance is often captured by, as John Lyne (2010) argues, a “third culture” (p. 139) that fuses the humanities and science. Brockman (1995) defines third culture as “[consisting] of those scientists and other thinkers in the empirical world who, through their work and expository writing are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are” (p. 17). Lyne observes that this third culture is made up not solely of experts in representative fields, but instead both experts and non-experts brought together by a shared interest with distinct points of view for discussion and participant that relies on the acceptance of “the legitimacy of both empirical and interpretive methods” (p. 139). According to Lyne, participants in deliberations should be brought together with some knowledge and openness to learning for rhetorical argument. Lyne’s exploration of third culture is based on Brockman’s (1995) collection of so-called third culture experts who can write for public audiences. Lee Smolin (in Brockman, 1995)

argues that the third culture embodiment is more than simply scholars who can write for the public; rather he sees in this third culture a comingling of philosopher-scientists who acknowledge the complexity of knowledge.

Lyne highlights where social and political scientists have crossed boundaries and became representatives of hard sciences. He refers to these scholars as “rhetorical performers” as they are rhetorically presenting scientific information. For example, former U.S. Vice President Al Gore’s campaign for greater sustainability and environmental awareness as presented in his documentary, *An Inconvenient Truth*, demonstrates the intellectual overlap between presentation, persuasion, and fact. This narrative frames an environment in crisis, pairing of facts and figures with tales of extinction of flora, fauna, and the impact on human kind. Nisbet (2009) refers to Gore’s *pièce de résistance* as “an environmental Frankenstein monster,” referencing its narrative of doom (p. 19). At the same time, *An Inconvenient Truth*, shows the humanities and the sciences working in a complementary tandem, creating a stronger presentation of argument en force by combining arts, rhetoric, and science.

Creative nonfiction is potentially an example of the ideal third culture embodiment. Gutkind’s (2011, 2013) experiment on science and creative nonfiction is an example of braiding narrative and science merged for the art of persuasion. The goal of such a study is to make science both relatable and engaging to the public sphere, meeting the public where they may interact easiest with scientists. Like Gutkind, Brockman (1995) recognized that the “role of the intellectual includes communicating” (p. 19). Scholars must be able to translate their work to share with the public. Brockman referred to these new scholars, as “third culture thinkers” and “new public intellectuals” (p. 19). The need for engaging scholarship and evidence in public deliberation carries over to multiple areas of complex science and technology issues and policies. At the same time, application of other braided, third-culture approaches cannot be ignored. Calls for additional deliberative tools that heighten cognitive reasoning come from a long list of exploratory research including visual presentations, expert lectures, television call-in shows,

computer-aided argument mapping, and web 3.0 digital democracies (e.g., Kurpius & Mendelson, 2002; Perez, 2008; Van Gelder, 2003; and Weeks, 2000).

Environmental and Sustainability Science. As science and technology issues become increasingly complex, the need for public input on policies is of growing importance, as recognized by policymakers' calls for more participation in science and technology policy issues (Rowe & Frewer, 2000). PytlikZillig and Tomkins (2011) argued:

The specific idea that the public should weigh in on science and technology is of fairly recent vintage: Its roots trace back to the ethical lapses of scientists that resulted in Congress mandating stricter oversight of the conduct of science via institutional review boards that included citizen representatives.... Public engagement, Congress indicated, promises the possibility of interconnections among science, technology, and society, allowing science and society to shape one another. (p. 199).

Public input is especially required for science and technology issues, particularly those with social, moral, ethical, risk, and legal implications (Rowe & Frewer, 2000). What makes deliberation about science so complex is not simply the topic at hand; rather, it is because participants' values play an important role in how participants deliberate and make decisions (Webler, 1998). However, the interaction of citizens and scientists and policymakers can guide policy decisions with an optimal degree of legitimacy. With the growing use of formal public deliberation exercises related to science and technology policy, studying how these fields overlap and inform each other is increasingly necessary to gain public understanding and policy decisions.

In particular, environmental and sustainability science provides an ideal framework for exploring the potential usage of creative engagement with science. Lindenfeld et al (2012) write that "[e]nvironmental communication provides particular strengths in the area of cultural and popular representations of nature and technical and scientific communication with the public

sphere and public understanding of science” (p. 32). Robert Cox (2013) defines environmental communication as “the pragmatic and constitutive vehicle for our understanding of the environment as well as our relationships to the natural world; it is the symbolic medium that we use in constructing environmental problems and in negotiating society’s different responses to them” (p. 19). Like other scholars, Cox recognizes the urgency and feeling of crisis around environmental and sustainability issues (see also Torgerson, 1999; Lindenfeld et al, 2010; & Bell et al, 2013). However, public participation involves individuals in environmental science and reflective policy decisions, particularly as environmental and climate science is so complex, giving the public a sense of agency in complex scientific decision-making (Jones, 2013).

Citizens feel more sense of ownership, legitimacy, empowerment, and relevancy in issuing a decision when participating in public deliberation for community decision-making (Cox, 2013). Cox expands on the use of public participation as not simply a forum for community deliberation and decision-making, but also participatory rights including access to information and ability to respond to and hold accountable decision-making agencies. Lindenfeld et al (2012) argue that particularly with sustainability science, it is important to bring together “multiple stakeholders and diverse communities” in order to gather a participatory group that is both representative and capable of dispersing such change (p. 30). Cox (2013) presented collaboration as another possible means of shared-decision making and problem-solving. Collaboration occurs when stakeholders are invited “to engage in problem-solving discussions rather than advocacy and debate” (p. 15). Similarly, Torgerson (1999) writes that the “distinction between consumer behavior and citizen action is vital for efforts to enhance democratic practice through discourse and deliberation in the public sphere” (p. 129).

Majone (1989) argues for the importance of context particularly when it comes to environmental discourse. Likewise, Kahan et al (2012) find that cultural context indicators were better predictors of opinions about environmental policy. Research shows that individuals use both heuristic and analytical methods of reasoning when making decisions, but when it comes to

understanding climate change risk, individuals rely more heavily on heuristic methods of reasoning, such as intuition and creative thought (Kahan et al, 2012). At the same time, environmental policy has increasingly been associated with political affiliation, and as such is polarized more so than some other science and technology fields. This politicization and heuristic analysis leads to a more heavy reliance on cultural and creative cognition. Given the politicization of environmental science, it provides one of the most ideal topics for contemporary deliberation studies.

CHAPTER 3. METHODS

In this thesis study, I explore creative methods of increasing stakeholder engagement about science and technology issues in focus groups consisting of deliberative discussion and feedback. I recruited four focus groups of between four and eleven participants each to review both a narrative-format (creative non-fiction) and rational-format (newsletter) background document (evidence), deliberate on community policy decisions related to the document, complete a survey measuring engagement, and provide feedback on the presentation format of the background materials (evidence). Specifically, I explore how public engagement will change through the use of literary informative documentation (creative nonfiction) combined with an interactive participatory setting (deliberation) in order to answer the following research questions:

RQ1. How, if at all, does the use of creative nonfiction as a method of information sharing and documentation affect participant engagement?

RQ2. How, if at all, do participants characterize the experience of background documentation presented in a narrative (creative nonfiction) and/or rational format (newsletter) on deliberative discussions?

Studies have shown that knowledge used in deliberative or dialogic settings can increase long-standing knowledge of participants (Pugh et al, 2010). As such, I examined the effect of the background evidence, creative nonfiction or newsletter format, as used in the group deliberation and dialogue to see how participants utilize the evidence provided in their deliberation and dialogue with each other, asking the following research question:

RQ3. How do individuals use and interpret creative nonfiction evidence or newsletter evidence in a deliberation?

Theoretical Perspective

Poole (2011) observes that communication can be studied as both the “exchange of information” and as “a process of the creation and sustaining of meaning” (p. 249). He defines communication as a:

process through which people and organizations exchange information;
form and dispute understandings; organize and coordinate activities;
influence on each other; create communities; and generate, maintain, and
undermine beliefs, values, perspectives, symbols and ideologies... (p.
249).

For Poole, communication plays a key role in decision-making and problem analysis. Public deliberation is an ideal test of communicative decision-making. Majone (1989) characterizes public deliberation as an activity that “mobilizes the knowledge, experience, and interest of many people, while focusing their attention on a limited range of issues” (p. 2). According to Majone, participants in a deliberation can gain knowledge, change their attitudes, and influence others. Using a deliberative discussion within the focus groups in my study allowed for both deliberative sense- and decision-making as participants worked to create meaning. This exercise examined how small groups interact to make decisions and formulate feedback about science and policy issues, taking into consideration the evidence provided.

The present study used a focus group setting to deliberate about science policy and provide feedback on scientific evidence. PytlikZillig and Tomkins (2011) call for empirical research on public deliberation looking to define the type, effectiveness, and rationale for deliberation. My thesis answers this call in examining how creative nonfiction shapes deliberative exercises through a variety of empirical measures.

Environmental Perspective

While this thesis study looks to inform broader research on engagement with complex science and technology issues, I ask questions about sustainability science as it is a topic that is

discussed in both popular media and in scientific venues. Majone (1989) writes that public deliberation in new scientific and technical arenas, including environmental regulation, are still deficient in the “standards of argument” (p. 3). Kahan (2012) argues that one reason to focus on climate science is not public misunderstanding of evidence surrounding climate change, but rather the way individuals mark their personal beliefs and alignment with their peers about climate change. Finally, Torgerson (1999) writes that an environmental discourse is necessary for the exchange of ideas that can “foster an imaginative interplay of identities, interests, and perspectives that encourages evaluations and judgments from an enlarged viewpoint” (p. 129). The ability to imagine a future of environmental and ecological advancement through technology, science, and policy stems from the ideas of humans as innovators and storytellers combined with the “influence of green politics” (Torgerson, 1999, p. 144). As such, green politics itself serves to more fully enhance the public sphere through environmental discourse and debate. Measurement of public deliberation on sustainability science highlights a topic that is a complex science, surrounded by urgency and oft-debated.

Procedures

Recruitment of Participants

Participants for this study were recruited through outreach to community organizations, university classes, and university departments. Participants ages 19 or older who are current residents of Lincoln, Nebraska were able to participate in the study. Participants were asked to be residents of Lincoln in order to more equally deliberate on community-based policy issues. Incentives were provided for participants in the form of extra credit for a course as provided by the instructor or compensation of up to \$10 (see Appendix 1 for the full recruitment script).

Data Collection

Focus groups were specifically chosen in able to control for deliberation, reading, and discussion and to provide a participatory atmosphere similar to the formal public deliberations sponsored by government agencies (i.e., participatory budgeting or public comments on

environmental regulation). Morgan and Krueger (1993) argue that focus groups are best used when there is a power differential between discussants and decision-makers (such as a deliberative setting). Focus groups provide for a descriptive, complex understanding of sense-making processes that individuals use when interacting with others as they compare and contrast ideas with others. The major benefit of focus groups is that it allows the presence of meaningful, group interaction to responses of questions, and as such, they provide insight into how people think and talk about complex issues, allowing a researcher to see different points of view (Morgan & Krueger, 1993). Likewise, Rowe & Frewer (2000) argue that focus groups offer a free discussion style deliberation with little direction from a facilitator. Each focus group was asked to both deliberate and provide feedback.

Each focus group followed a schedule as described below and listed in Appendix 2. The schedule of questions is modified from the *Using Creative Non-Fiction as a Means of Presenting Scientific Information Energy Policy Survey and Community Conversation* designed by PytlikZillig et al, 2012. Participants in the study followed the schedule below and asked to provide feedback and input where appropriate:

1. **Pre-Survey.** Participants were asked to complete a pre-survey when they arrived to the focus group. This pre-survey asked for their initial opinions regarding anthropomorphic climate change (“global warming”) and deliberation. This pre-survey served to measure how aware they were of climate change issues as well as how engaged they were with climate change issues prior to this focus group.
2. **Background Document.** Participants were asked to read a background document providing information about climate change to inform their group deliberation. Participants were provided with either a background document presented in Creative Nonfiction or Newsletter format (see Appendix 2). Two of the focus groups received the Creative Nonfiction document first

while two focus groups read the Newsletter document first in order to control for differences.

3. **Group Deliberation.** Participants were guided through a deliberative discussion using a handout (see Appendix 2) wherein they were asked to provide input on policy decisions regarding sustainability in the city of Lincoln. Each group selected a recorder and turned in their response sheet at the end of their deliberation. The group deliberation was audio and video recorded.
4. **Post-Survey.** Participants completed a post-survey asking for their personal feedback about the exercise including the deliberation and background documents (See Appendix 2). This post-survey utilized the engagement scale detailed in PytlikZillig et al (2013) and used in the PytlikZillig et al (2012) study. This post-survey also collected basic demographic information to account for education, occupation, and political affiliation.
5. **Focus Group Questions.** Following the deliberation and post-survey, participants were asked for feedback regarding the background document and deliberation (see Appendix 2e). These questions were original and not based on the PytlikZillig et al, 2012 study. The focus group questions and responses were audio and video recorded and were transcribed verbatim for qualitative analyses as detailed below.
6. **Background Document.** After providing initial feedback, participants were asked to read the alternate background document, whichever they did not read in Step 2 (see Appendix 2).
7. **Focus Group Questions.** After participants read both background documents, they were asked to compare and contrast the two documents for engagement, usefulness, and interest using the focus group questions (see

Appendix 2). These focus group questions and responses were also recorded and transcribed verbatim for qualitative analyses.

Measures

This study incorporated a multi-layered analysis with both qualitative and quantitative methods. Each focus group was analyzed for both deliberative and feedback themes. Each participant completed a post-survey to measure for their engagement with the materials and with the deliberation. I quantitatively analyzed all the pre- and post-surveys after each focus group in order to test for engagement, knowledge, and attitude change. Quantitative analysis looked for outside effects on deliberation such as pre-knowledge, political alignment, or pre-engagement with environmental science. Each focus group was transcribed verbatim, and I studied the transcripts several times and reviewed initial observations. Next, I conducted an interpretive analysis of the data, using axial coding in the transcripts to identifying themes and concepts and ensure that they relate to the research questions (Rubin & Rubin, 2012; Corbin & Strauss, 2008; Owen, 1984). Third, deliberative and dialogic analyses were completed for qualitative data in order to gather feedback on the evidence. Fourth, I searched for responses to my research questions, looking to discover how participants articulated their engagement with the background materials and deliberative discussion. Next, I analyzed the engagement scale for simple means and differences in engagement between the creative nonfiction and newsletter conditions. After coding based on the thematic analysis and quantitatively analyzing the pre and post-tests separately, I compared the results, critically analyzing differences and correlations.

Thematic Analysis

Using Owen's (1984) thematic analysis technique, I studied each focus group transcript for themes according to recurrence, repetition, and forcefulness. Owen defines *recurrence* as how often a similar idea or core concept comes up in the foreground of a transcription. *Repetition* is the restatement of "key words, phrases or sentences" (Owen, 1984, p. 275). Repetition is an extension of recurrence, though it is the "explicit repeated use of the same wording," while

recurrence is the “implicit recurrence of meaning using different discourse” (p. 275). The third criteria for establishing a theme according to Owen is *forcefulness*, which “refers to vocal inflection, volume, or dramatic pauses which serve to stress and subordinate some utterances from other locutions in the oral reports” – also including the “underlining of words and phrases, the increased size or print or use of colored marks circling otherwise focusing on passages in the written reports” (p. 275-276). I looked for themes related to participant engagement, attitude change, and feedback. This analysis was completed to answer *RQ2. How, if at all, do participants characterize the experience of background documentation presented in a narrative (creative nonfiction) and/or rational format (newsletter) on deliberative discussions?*

Dialogic Analysis

Focus group and deliberative data was analyzed qualitatively for input and discussion. A deliberation and discussion consists of small group interaction. Similar to Oswick et al (2000) and Oswick et al (1999), I examined the dialogue in a video recording of each focus group session and examined how the focus groups reconstructed meaning about and provided feedback on complex issues. This qualitative analysis was supplemented by the quantitative results from the pre-survey and post-survey of participant demographics, individual characteristics, and engagement measures. Social Communication Theory states that part of our sense-making stems from our communication with others and where that interactive sense-making interplays with group and cultural affiliations (Sigman, 1987; Fairhurst, 1993). As such, it is important to incorporate both how participants interact (dialogue / deliberation) as well as the pre-knowledge, affiliations, and engagement (individual characteristics) participants bring into an interaction. This analysis was completed to answer *RQ1. How, if at all, does the use of creative nonfiction as a method of information sharing and documentation affect participant engagement and deliberation?* and *RQ2. How, if at all, do participants characterize the experience of background documentation presented in a narrative (creative nonfiction) and/or rational format (Newsletter) on deliberative discussions?*

Deliberative Analysis

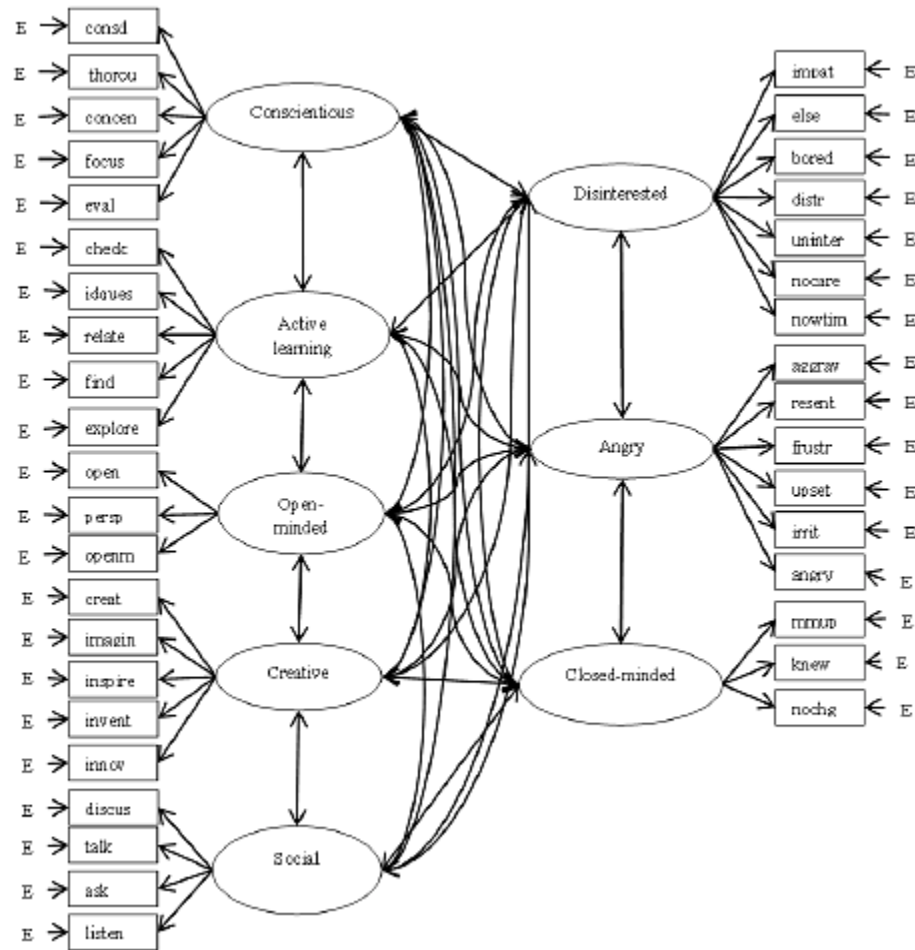
Institutionally-driven public participation has gained popularity more recently as a way to measure citizen engagement and public input for local to national scale decision-making and policy analyses (Cohen, 1997; Gastil et al, 2002; Fishkin, 1991). According to Gastil et al (2002), the goals of such participation models hope to yield “informed and reflective judgments, a greater degree of political efficacy, and, ultimately, an increase in the frequency of political action” (p. 587). Gastil and Dillard (1999) outline their quantitative measures for attitude change and engagement in deliberative settings. Drawing from a basis in both communication studies and educational psychology, I analyzed the group deliberation and discussion for both the groups’ reported decisions (quantitative), their reported rationale (qualitative & quantitative), and their deliberative discussion (qualitative). I utilized a simple means test for decisions and policy recommendations of each focus group, looking at any individual and group differences. The deliberative analysis looked for transformative engagement, which is shown to increase long-standing knowledge in participatory individuals (Pugh et al, 2010). If individuals are increasingly engaged with evidentiary materials and refer to materials in deliberative dialogue, there is a greater likelihood of the information retention in the long run. These measures of input were compared with the Varieties of Public Engagement (VoPE) Scale in the post-test analysis. The deliberative discussion demonstrated how groups made sense of topics using evidentiary information in various forms. This portion of the analysis answered *RQ3. How do individuals use and interpret creative nonfiction evidence or newsletter evidence in a deliberation?*

Engagement Scale Analysis

Engagement may be thought of socially, civically, or cognitively. PytlikZillig et al (2013) argue that effective measurements of public participation should include measures of participants’ “cognitive and affective experiences” and individual characteristics. Engagement measures account for the “intensity and quality of participant overt and cognitive behaviors and affective responses at the individual and situational level (how the participant engages

cognitively, affectively, and behaviorally in a target activity, situation or context)...” (PytlikZillig et al, 2013, p. 3). PytlikZillig et al’s Varieties of Public Engagement (VoPE) scale looks to measure active learning, contentious engagement, (dis)interested engagement, open/closed-minded engagement, angry engagement, and social engagement (see Figure 3.1). I incorporated this VoPE scale into my group measure to better understand how participants engage with the background document. I tested how engagement can be transformative to participants through deliberation, dialogue, and presentation of evidence. Pugh et al (2010) described this transformative engagement in terms of educational settings, as having long-lasting effects on knowledge and opinions that affect daily life. The present study tested how creative nonfiction, as a tool for public deliberation, engages participants with a topic and with each other. The engagement scale analysis was primarily measured quantitatively, using a five-point Likert-type scale of self-reported reactions to the background document. This measure can be correlated with individual characteristics examining how participants’ beliefs as well as their feelings about public engagement. This data was supplemented using feedback and quantitative data from the focus group and the deliberation data. This analysis informed the answers to each of the research questions.

Figure 3.1. Theoretical Structure of the Varieties of Participant Engagement (VoPE) Scales (PytlíkZillig et al, 2013).



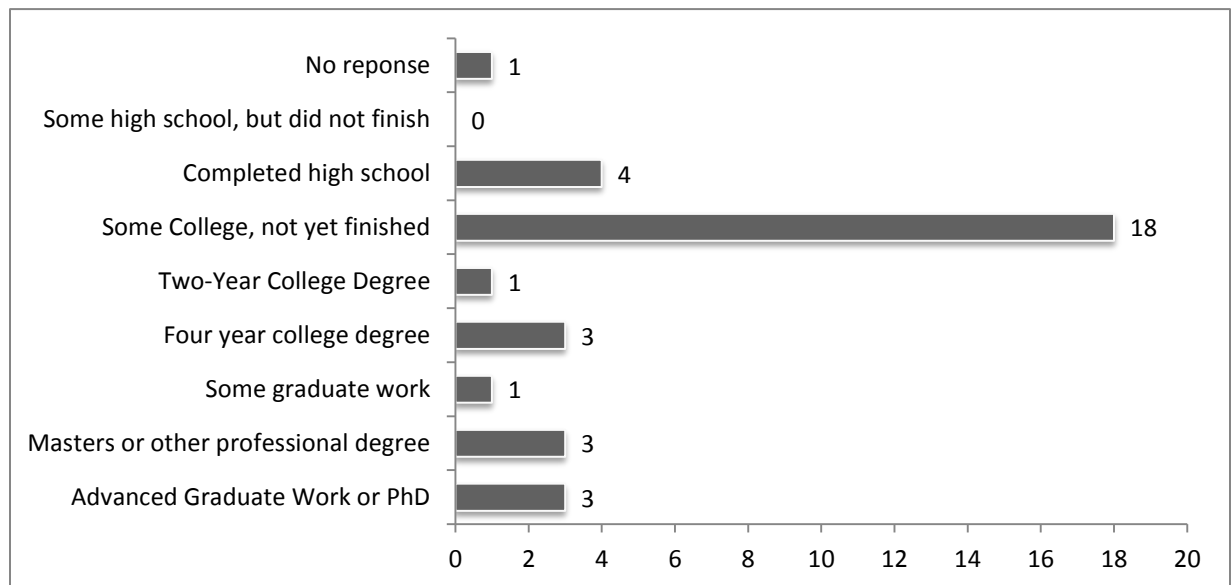
Verification Strategies

Data in this study was coded by each focus group and condition as aggregate data. Corbin and Strauss (2008), in claiming that researchers must take responsibility to ensure “validity and reliability” of their research (p. 299), argue that it is important to also ensure quality findings that are “innovative, thoughtful, and creative” (p. 301). Findings in my study were validated through triangulation and data conferencing. Triangulation is a validation method in which researchers use multiple sources of data (e.g., focus groups, surveys, deliberation) to verify conclusions (Creswell, 2007; Steimel, 2011). I used interactive data-conferencing to validate my findings with a cohort of researchers for critical feedback.

Participants

Four focus groups were held; two groups received the creative nonfiction (CNF) background document first (n=13) and two received the newsletter (NL) style background document first (n=21). Of the participants, 13 were male and 19 were female. Most participants reported that they were students (n=18), and most respondents indicated that they had completed at least some college (see Figure 3.2). The participants politically identified most closely with Independent, though those in the CNF manipulation leaned more Republican ($\bar{x} = 5.14$, on a scale of 1 (Strong leaning Democrat) -7 (Strong Leaning Republican) scale).

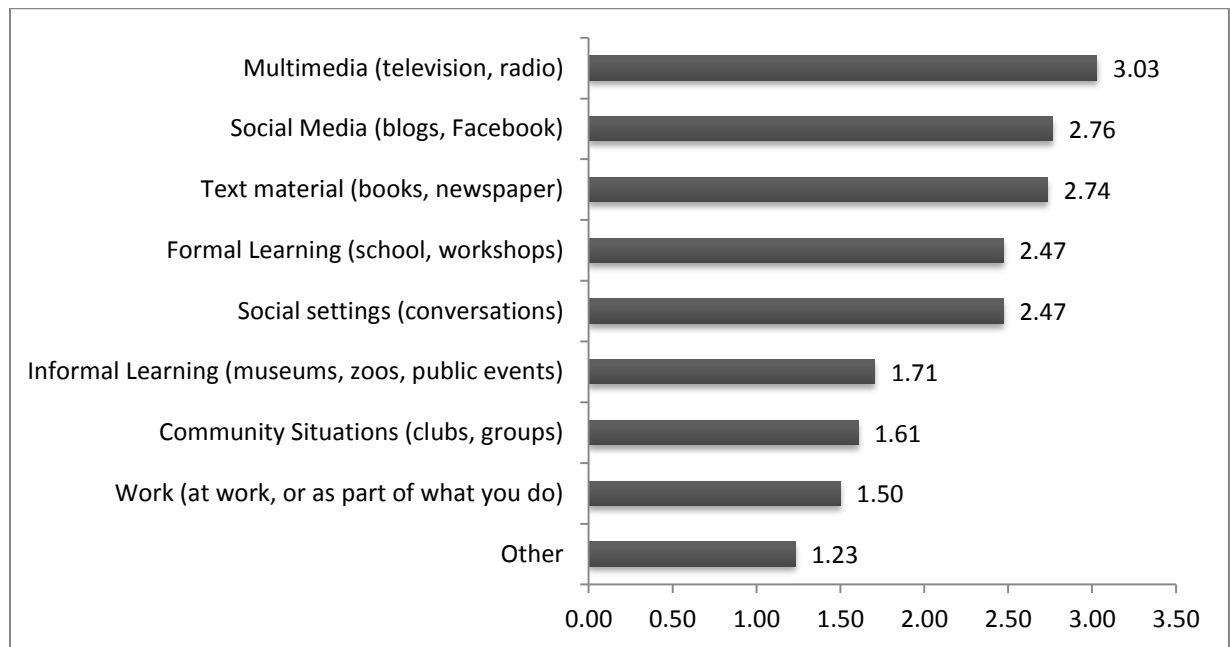
Figure 3.2. Reported education level of participants



CHAPTER 4. RESULTS

The present thesis explores different formats of information sharing for public deliberations. My goal was to find recurring patterns as I met with participants and gathered their feedback on the reading materials. In particular, I looked to find how creative nonfiction (narrative) or newsletter (rational) formats influence participant engagement, experiences, and evidence in a deliberative environment. To do so, I asked participants to read materials and participate in a brief deliberation on local sustainability programs. I then asked the participants about their experience, asked them to read the document in the next format (creative nonfiction or newsletter format), and asked them to compare and contrast the two types of information sharing. I listened for themes to emerge from participants' experiences with the readings and feedback from the deliberation. Key themes in response to each research question were found in the areas of Engagement, Knowledge, Bias, and Multiple Formats. The findings in this chapter are presented under these four themes using the qualitative analyses from the focus groups and quantitative data as gathered from the pre- and post-surveys, which were completed by all 34 participants.

To account for any pre-knowledge or information with which the participants came into the focus groups, the participants were asked where they learn about climate change and how much they feel they know about climate change. Participants reported that they have learned “some” about climate change and similar topics over the last year on a scale of none, a little, some, quite a bit, or a great deal (1-5 respectively, $\bar{x} = 3.24$, $\sigma = 1.05$). Participants heard about climate change most often through multimedia sources, such as television or radio ($\bar{x} = 3.03$, $\sigma = 1.00$), and social media ($\bar{x} = 2.76$, $\sigma = 1.18$). Least likely sources about information on climate change were “other” ($\bar{x} = 1.23$, $\sigma = 0.71$) and “work” ($\bar{x} = 1.50$, $\sigma = 0.96$). Those participants who described the “other” sources of climate change information included sources such as “regional conferences” or “visiting the glaciers.”

Figure 4.1. How Participants Receive Climate Change Information

Participants reported that they felt between “not very well” to “fairly well” informed about climate changes issues on a scale of not at all, not very well, fairly well, or very well informed (1-4, respectively; $\bar{x} = 2.65$, $\sigma = 0.88$). To help determine any opinions or thoughts that they had in advance of the focus group, participants were asked if they thought global warming was happening. Generally, the participants thought that global warming “probably is happening” on a scale of yes definitely, probably, probably not, or definitely not happening (1-4 respectively, $\bar{x} = 2.03$, $\sigma = 0.83$), however, participants reported that they needed “some more information” on a scale of if they needed a lot more, some more, a little more, or not any more information ($\bar{x} = 2.12$, $\sigma = 0.86$).

ENGAGEMENT

Participants in this study reported feeling engaged in the activities overall; however, participants explained that they enjoyed and felt more engaged with the creative nonfiction (CNF) background document more so than the newsletter (NL) background document. Two participants directly discussed engagement with the information in the CNF document:

CNF/1/3⁴: I definitely felt more engaged with the first one [CNF] and less tuned out because I had somebody interpreting their response for me. So when he was like “Oh, I was surprised” then I think “Oh, so was I, I was also surprised by the piece of information.” So I was more engaged with it personally even if I didn't retain all the numbers and things like that.

NL/2/1: I think in these circumstances where this [focus group] is like optional and I'm just kind of participating, I would have retained more information from the second version [CNF] because you can relate the ideas to the names of the people that presented them and different little keys of the story and little reminders and you're not actually focused on like textbook reading and classroom work. So just for like everyday reference.

Overall, participants reported feeling more engaged with the CNF reading than the NL reading. According to the Engagement Scale, participants in the CNF condition felt more engaged than the NL condition in areas such as “Felt creative” and “Gave careful consideration to all options presented” (see Appendix 3 for VoPE Scale results). At the same time, CNF readers reported higher levels of feeling “frustrated” and feeling “bored” than that of their NL counterparts. While the numbers on the engagement scale do not show strong effects (see Appendix 3), the participants often reported that they not only liked the creative nonfiction reading better, but that the CNF reading helped them feel more connection to the topic. One participant said that the information “needs to be relatable; it needs to be a type of communication that can be comparative for that individual or group” (NL/4/5). Another participant reported that the CNF reading felt more relatable:

NL/4/3: It [CNF] seemed more relatable I guess, as a normal, average, everyday person than a whole bunch of scientists talking about facts. Where the facts were still in here, the way that it was written was more along a story line.

Some participants felt that the CNF helped make them feel more at ease to set them up for the discussion. One participant stated that the CNF background document made her feel “not so nervous for the rest of it” and that the story “was an easy way to get into a really difficult subject” (CNF/3/7).

⁴ Participant comments are labeled by condition they read first (CNF/NL), Focus Group Number (1-4), and Group Participant Number (1-11). A total of 34 individuals participated in this study.

Some participants reported that the CNF document more strongly elicited an emotional response than the NL document did. One participant stated that the CNF reading had more of a “pang” to those individuals who would be most affected by global warming.

NL/2/3: I guess if you are trying to elicit more of an emotional response, this one [CNF] has more of a pang than the other one does. We talked about how the college student in the Old Market, or the reporter came to the conclusion that his generation, or our generation, is going to have to deal with the effects and adaptation. So I think that a little more, if you’re talking to this generation at least, it would elicit more of an emotional response.

Another participant stated that they felt more “inspired” by the CNF reading than the NL reading over all: “When that [post survey] asked if we were inspired I was like ‘oh, yeah I kind of was,’ but with this one [NL] I was just kind of like ‘oh, this is something we need to do’ but it didn’t make me feel inspired” (CNF/1/2).

Multiple participants reported that the CNF document helped them set their mindset and focus for the deliberative discussion. One participant said, “... I liked the global [document] because I felt like it reaffirmed that maybe we should be considering something in Lincoln and here’s why, because it is happening on a global perspective. ...it was like, oh yeah, this is why we need to focus” (NL/4/4). Another participant stated that the CNF document helped him follow along:

CNF/3/9: But I also like, like if it came out of text book and was just like fact after fact and like, I think it would be easier to skim through that and not really pay attention. When you are reading the story you are kind of following it a little better. Because I know we’ve all read like text book material and it’s easy to drift off I think.

At the same time, CNF readers surveyed reported that they felt slightly less focused ($\bar{x}=3.36$) than those who read the NL document ($\bar{x}=3.47$). CNF readers also reported that they “felt bored” more often ($\bar{x}=2.36$) than NL readers ($\bar{x}=1.74$) (See Appendix 3).

When participants are engaged in a topic, they may show more attitude change.

Participants were asked if they felt that their attitude changed about global warming after

completing the first reading and deliberation. Most reported that their attitude changed, though “not very much” or just “a little” ($\bar{x} = 2.68$) on a scale of 1 (not at all) to 5 (yes, very much). Participants in the newsletter condition reported a greater attitude change ($\bar{x} = 2.75$, $\sigma=0.79$), while those in the CNF condition reported slightly less attitude change ($\bar{x} = 2.57$, $\sigma=0.1.22$). Participants in both conditions participated in a deliberation, which could have swayed their attitude in addition to the readings. The present study was designed to test the effects of evidence within a deliberative environment, so effects are viewed as stemming from the condition (CNF or NL) and further activated by the deliberation. When asked if they thought global warming is happening, most participants responded that they thought it was “probably happening” ($\bar{x} = 1.94$) on a scale of yes definitely, probably, probably not, or definitely not happening (1-4 respectively), but felt less sure compared to the pre-survey ($\bar{x} = 2.03$). Those in the CNF condition felt more strongly that global warming is happening ($\bar{x} = 2.29$) than those in the NL condition in general. The readers in the CNF condition became less certain that global warming was happening, while those in the NL condition became more certain that global warming is happening (see Table 1).

Table 4.1. How strongly participants felt global warming is occurring

Condition	Pre-Survey Mean	Post-Survey Mean	Difference
CNF	2.21	2.29	3.62%
NL	1.90	1.70	-10.53%
Overall	2.03	1.94	-4.43%

Scale= 1: Yes, definitely occurring – 4: No, definitely not occurring.

Similar effects were seen in how participants reported feeling about climate change. In the post-survey, participants overall reported feeling slightly less concerned / more cautious (Alarmed, Concerned, Cautious, Disengaged, Doubtful, or Dismissive, 1-6 respectively) about climate change than the pre-survey ($\bar{x} = 3.24$). Participants in the NL condition became less disengaged and more cautious about climate change, while the opposite was true for the CNF

condition (See Table 2). Likewise, in a similar study⁵ of 156 undergraduate students, 52% reported feeling between concerned (24%) or cautious (38%) about climate change.

Table 4.2. How participants described their feeling about climate change

Condition	Pre Survey Mean	Post Survey Mean	Difference
CNF	2.95	3.29	11.53%
NL	3.64	3.0	-17.58%
Overall	3.24	3.12	-3.70%

Scale: Alarmed, Concerned, Cautious, Disengaged, Doubtful, or Dismissive, 1-6 respectively

The difference in attitude change is likely attributed to the background documents since no other variables changed during the course of the study.

Discussion

In this study, I use Reeve et al's (2004) definition of "engagement" as being the intensity and quality of one's active involvement. While the participants did not show a strong difference quantitatively, particularly with such a small sample size, they describe feeling more engaged with the CNF reading than the NL reading. Additionally, they generally reported that they "liked" the CNF reading better than the NL reading. For example, one participant said, "I think I noticed a lot of the same facts as the first [NL reading], it [CNF reading] was just more interesting to read so I think it would be helpful" (NL/2/1). In some groups, participants reported feeling like the story felt "fluffy" or "cheesy." At the same time, participants picked out facets of the story that they brought up in their discussion such as information about the coffee, the narrator's profession, or small quotes. In their deliberation, the participants did not refer to the reading except to cite more information about community-specific programs. Many participants stated that although they did not explicitly cite data from the background reading, they felt that the readings helped influence their thinking as broadening the way that they thought about the local programs. For example, one participant said, "I liked the global [information] because I felt like in reaffirmed

⁵ PytlikZillig et al 2012 study of 180 University of Nebraska undergraduate students about local energy programs.

that maybe we should be considering something in Lincoln ... because it is happening on a global perspective” (NL/4/4).

One of the key reasons for feeling more engaged with the CNF reading, was that participants reported more of an emotional connection with the CNF reading. If, as Marcus (2005) and Dietrich (2013) argue, emotion plays an important role in reasoning as well as decision-making, then a document that sparks a more emotional connection is likely to increase engagement. In the same way that emotions play a role in determining how individuals make decisions, relatability is an important factor in individual and group decision-making capabilities. Participants stated that relatability helped them retain more information and helped them think about the impact of the programs.

Fisher (1984) discusses the importance of relatability in decision-making; individuals make decisions by drawing on their personal experiences, beliefs, and relationships. The ability to “put oneself in someone else’s shoes” becomes an important tool in making topics more relatable to the audience. If deliberation participants can put themselves in the shoes of a narrator learning about a complex topic, the way they make a decision may be influenced by that narrator. One participant in particular mentioned that they feared their responses in the deliberation or post-survey would be shaped by what they thought the narrator would say rather than what they would say (CNF/3/6). The goal for a deliberation would not be to necessarily influence their responses, but rather inform participants’ response. In the present thesis, as participants reported that they felt the CNF reading was more “relatable” to them because it fell along a “story line,” the underlying response is that the CNF reading is also aiding in their decision-making process.

KNOWLEDGE

In terms of knowledge, some participants felt like they learned information from the readings, while others felt that it helped shape their frame of mind. However, quantitative pre- and post-survey data did not show significant differences in knowledge between the two

conditions (see Table 3). In the pre-survey, participants were asked several knowledge questions to determine what they knew about climate change before to the reading to help determine how much prior knowledge they had about the topic. They were asked to rank how true or false they thought each item was (1=Definitely False; 4=Definitely True). In the post survey, participants were asked the same questions to determine if there was a significant change between the groups. Both groups decreased in the response of “don’t know” for the knowledge question. However, both conditions yielded only slight and varying changes in knowledge (see Table 3).

Table 4.3. Participant knowledge questions in pre- and post-survey (1=False; 4=True)

	CNF Pre Survey Mean	CNF Post Survey Mean	Don't Know	NL Pre Survey Mean	NL Post Survey Mean	Post Survey Don't Know
Increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to global climate change.	3.07	3.40	0	3.00	3.40	0
Human activity, including industry and transportation, is a significant cause of climate change.	3.14	3.10	0	3.29	3.45	0
If global warming occurs, it will increase crop yields in some places, and decrease it in others.	3.00	3.23	9 (2 CNF; 7 NL)	2.82	2.93	9 (3 CNF; 6 NL)
Currently observed climate change is mostly due to normal climate patterns.	3.00	2.44	6 (2 CNF; 4 NL)	2.77	2.27	6 (1 CNF; 5 NL)
The Earth's climate is warmer now than it has ever been before.	2.50	2.75	8 (4 CNF; 4 NL)	3.09	2.90	3 (3 CNF; 0 NL)
Compared to the climate of the past one million years, the last 10,000 have been unusually warm and stable.	2.56	3.30	15 (5 CNF; 10 NL)	2.64	3.06	7 (3 CNF; 4 NL)

If humankind suddenly stopped producing carbon dioxide today, climate change and global warming would still continue for many years.

Over time, any climate change that happens will be more beneficial than harmful.

2.85	3.00	8 (1 CNF; 7 NL)	3.29	3.41	3 (0 CNF; 3 NL)
1.91	1.80	13 (3 CNF; 10 NL)	1.91	1.64	9 (3 CNF; 6 NL)

Despite not seeing marked quantitative differences in knowledge from the pre- to post-survey, participants thought the documents were useful over all. One of the most common commendations of the background information in general was that the background documents helped broaden the participants' thought process with regard to local sustainability programs. For example, one participant in the NL condition commented:

NL/2/6: In terms of the broad information though, that [NL reading] was really good. It was concise and it brought up a few different valid viewpoints, so it was good to get a little more in-depth perspective of what I think all of us have all heard talk, rumblings about.

Similarly, participants in the CNF condition commented on applying a broader thought process or setting the tone for the deliberation due to the readings. One participant stated "if you just talked about Lincoln programs [in the document] I think our discussions would not have been as focused about the broader aspect of climate" (CNF/3/3). Other participants agreed that the CNF reading was helpful in "setting the tone" or mindset for the deliberation, even if the specific facts weren't as useful to the deliberation session.

CNF/3/4: ...we are not so much applying that background information as we are talking about actual, real-world solutions so the background information was nice and it got us in the right head space I think but that wasn't exactly what we were necessarily discussing at a fundamental level when we were, if that makes sense. It set the tone definitely, and gave us some information.

CNF/1/3: ... I was definitely guided by the tenor of the reading materials and I liked the way that they were presented so it wasn't just a fact, fact, fact, fact, fact.

And actually the facts kind of get lost, but when you get is the general message that global warming is real, or 92% of scientists think that humans are in charge or causing these things, and so it just sort of builds a little bit on what you already know and helps direct your thought process for that.

In the deliberation, participants used their own knowledge, opinions, and experiences to shape their response to the deliberative questions. When asked about how she shaped her opinions on the deliberative questions of local programs, one participant responded “I used my own experiences I think, because I tried to find something to relate it to...” (NL/4/4). Other participants made connections to experiences and knowledge that they had coming into the deliberation.

NL/2/6: I made a lot of connections personally to other classes that brought up global warming and climate change as a whole. My freshman year I took a few classes that brought up just the basics and I was able to connect points that they brought up to that to what we had read here.

Just the Facts

While some participants enjoyed the readings for setting the tone, some participants preferred the “just the facts” approach of the NL reading. One participant, after reading both kinds of information said:

NL/2/6: ... I think when it comes to science and things like that you need to be able to go straight into what the facts are that are helping you debate something, so I think as far as coming up with ideas about what services we want in Lincoln as far as sustainability, it would have been harder to go to like a creative writing story and find facts than when you just have a chart at the end, like a picture or something and then straight facts, so maybe it's more interesting to read, but it is harder to find the facts straight away.

Agreeing, another participant said:

CNF/3/1: I liked how this one just cut to the chase and left out the guy's story because I really didn't care about why he was interested in the topic I cared more about ... what he had to say about it and what he found out.

Some participants liked the NL presentation because they felt that the story pulled their focus away from the facts. One participant said, “I think it was like kind of hard to pull the facts out of the second one [CNF] because you were like more focused on the story aspect of it than

you were the like the actual [facts]” (NL/2/6). Several student participants attributed this desire for “just the facts” to how they learn on a day-to-day basis in school.

NL/2/3: If you consider like how we learn in classrooms, it's set up more like the first reading [NL] with a main heading and points and things like that, and that's how I retain information better versus reading a story out of a text book, which is a little different from how I learn. I think just personally, the way that I learn, if I knew nothing about the topic, I would have preferred the first reading.

Some participants preferred “just the facts” because they didn’t feel that they could trust the narrator to interpret or find the facts for them in the CNF version of the document.

NL/4/9: ... I don't like reading stuff with story and facts in it. It just makes me critical of who the writer is and I just like reading like a journal whatever with like a whole bunch of facts so I can see the sources and stuff like that.

Another concern about the CNF reading was the some participants worried that the narrative might “talk down” to participants.

CNF/1/3: I guess it depends on the level of knowledge that the participants come in with... Because a lot of people would think that reading a story like this that has a narrative to it maybe is a little beneath them. If I was somebody who already had a lot of knowledge about environmental climate change and things like that then reading a story would be more like reading a children's book.

While some participants preferred the NL format for deliberation, others saw the usefulness of the CNF format or application of both formats:

NL/4/5: I know as a teacher I have to go both ways. I present for some of the students that want that are just “give me the hard facts and move forward” and then the others that you have to tell a story to, reach them anyway you can.

Some participants found that they preferred the CNF version because it was helpful to their overall knowledge or that it was easier to read. While some participants preferred the style to match their learning style, others preferred reading the CNF document because it was different than their typical learning style.

CNF/1/3: I suppose it depends on your learning style. It's [NL reading] less helpful for me, I liked the narrative kind and I had the time and the interested. I didn't feel talked down to.

CNF/1/2: It [NL reading] feels like a text book. Maybe being a student that's the last thing I want to be reading.

Overall, most individuals felt that the CNF format was the most reader-friendly and that it would appeal to a broad audience:

CNF/3/7: I think the first one [CNF] might be more appealing for those that don't have any education, mostly because, science was not my thing and I liked the first one [CNF] more because of that. It made something that honestly I got bored with you know, when it was just laid out, it [CNF] made me want to learn more about that, you know, "Where's he going to go next? Maybe he will go the India to talk with a professor..." you know, I was excited. I wanted to know what else he was going to learn. Whereas this [NL reading] was like "I'm reading a textbook, this is boring, this is schoolwork."

Discussion

Participants in this study showed small increases in knowledge, particularly with the decreased number of "I don't know" responses on the knowledge scale questions. Majone (1989) showed that public deliberations can help to utilize individual knowledge while focusing individuals' attention on a subject. Participants in this thesis study reported that the information in the readings, both CNF and NL conditions, helped pull in their previous knowledge (e.g. from classes) and their experiences to help set the tone for their discussions. By assisting in setting the mindset and providing information to the participants for the deliberation, readings paired with the deliberation created knowledge (e.g., Goodnight, 1987). Similarly, Pugh et al (2010) shows that when knowledge is used in deliberative discussions, knowledge is transferred into long-standing knowledge gains. When engagement is high, it can be linked to increased knowledge and vice versa (Jacobs et al, 2010; Lindenfeld et al, 2010). What would make these claims more impactful would be to ask questions about the community programs and broad knowledge a third time six months past the deliberation to see what participants recall from their long-term memory.

Some participants in the present thesis preferred a "just the facts" approach and were concerned that the extra "fluff" in the CNF reading was distracting or pulled away from the basic facts of the reading. In this sense, they seem to be arguing in favor of Rowland's (1995) claim

favor of the rational paradigm and use of rationality as the only tool for evaluation and problem solving. However, Fisher (1984) argues that the rational and the narrative paradigm work best when paired together. Some individuals were concerned that framing facts within a story could feel elementary to readers. Others felt that mixing the facts in with a story made them feel more critical of the facts because of the association between story and fiction.

Based on participants' input, however, the desire for a "just the facts" approach was also of interest because it would help them answer the questions in the deliberation more simply. During the deliberation, participants requested charts with a breakdown of programs, funding sources, benefits, and costs. Participants who wanted "just the facts" appeared less interested in the broader context of the information, but wanted more detailed information on the policies at hand. A key test of this information would be to present facts in a narrative with a short list of facts or program information following.

While some participants were concerned about simplifying the reading, some participants thought that the CNF reading would appeal to a larger audience since it felt like an easier read. Over all, they preferred having the readings to inform them of both the broader implications (global environment) with the information about the local policies and programs. One participant stated, "it makes me wonder if we did the deliberation before we read anything if we would have been more black and white, yes or no to the questions" (CNF/1/1). The idea that the readings helped individuals think more deeply about the impacts of the deliberation show that both the NL and CNF readings influenced broader-knowledge application in the deliberation.

BIAS

In comparing the CNF format to the NL format, some participants found the CNF format to be more biased or less believable. Those who found the CNF format to be less believable stated that they did not trust the narrator or that they attributed the creativity to fiction. Participants reported that the NL document felt less biased than the CNF document, and that the NL document reported “both sides of the issue” (NL/4/2).

CNF/2/2: Maybe [the CNF document was] more helpful, but maybe more biased also... [I]t goes further in depth than the previous [NL] paper elaborated on, but it also has kind of, I mean I'm not arguing against the facts, but it kind of puts a sway one way, so I think that would be good to show first. But I think it's informative. ... I guess another thing I noticed was the first sentence where it says “save taxpayer money now for the future” that's obviously a lot more biased than the first [NL document]. Kind of just stating that it's a financial thing, not just an environmental thing.

One participant felt that the facts were misplaced in the story format:

NL/2/3: And you asked if it was believable. Just like how he worded everything, like “Huh? I snapped, surprised at the unexpected intrusion.” I just felt like... in a story where you are just looking at the facts it makes it more of like a fictional story that you're focusing on. Like that little stuff was unnecessary. ... It felt weird to add facts cause it was so animated and in depth about what he was feeling rather than the facts.

Other participants found the CNF format to be more biased in favor of global warming than the NL version.

CNF/1/4: My only concern-- and I think you alluded to it earlier-- The narrative does read easier, but I think you've got to be careful if you're setting people up to feel a certain... bias factor in the narrative. I think you've got to be able to write the narrative in a way where it doesn't swing -- because you got suspicious or a little skeptical of it right? ...It's like wait, they are trying to make me feel one way or another, it becomes more of a propaganda piece rather than “Hey let's get the facts out kind of thing.”

The participants had concerns that the biased nature of the CNF reading would be off-putting to individuals in a deliberation. One participant said, “[The CNF Reading] presented a lot of facts, but I feel like someone of the other, someone who doesn't think global warming is a thing would

not agree with those or rebuttal that” (CNF/3/9). Participants felt that they would trust a document less if it felt political in nature.

NL/4/2: Right, because I think people can grasp it but also to make it so it's not politically motivated so you get, for lack of a better word, kind of a fair and balanced both sides of the argument. For example, I think about Al Gore going out and presenting this whole global thing. That turns a lot of people off because they don't like Al Gore. So to the extent that you can leave politics out of it when you are trying to inform the general public so I think that would help so that they aren't feeling like they are lied to....I think there is a trust issue I guess, depending on who is delivering the message.

Some individuals attributed the biased feel to the idea of following a narrator through the facts.

Some participants expressed that the narrators point of view would influence their own choices in a deliberation.

CNF/3/6: I feel like when it's a story through, it like you get a story involved it like sets up the question like you're going to answer the question that way because you're going for that character, you're like “oh I like him, I'm going to circle that one.” ... You need to make the decision based on that instead of, there's a little bit of a psychological factor I think.

Discussion

Some of the apprehension about bias in the readings was due to the style of the readings.

CNF readers wanted to know who the narrator was and were concerned about the opinions the narrator was gathering. NL readers felt that the NL document was less biased because it presented different points of view more side-by-side than embedded in a story format. Some participants were uneasy about who was speaking in the CNF reading, which they felt decreased the believability of the story and could lead to a more biased interpretation. One participant said, “I like this how [the NL reading] is almost straight facts where the other one was ‘I did this’ or ‘I did that.’ Well, who is speaking? Who are we listening to?” (CNF/1/1).

Hartelius (2008) argues that when individuals are concerned about the credibility of the messages, it can undermine the deliberation by making them more apprehensive over the legitimacy of the source rather than the facts. Participants expressed unease over potential bias in

the materials and wanted the documents to show multiple perspectives, including an anti-global warming perspective. While conducting the focus groups, I attributed this to their own beliefs; however, the quantitative input from the pre- and post-surveys show that the participants most often believed that global warming was occurring and did not disagree with the facts at hand in general. The concern over equity among global warming perspectives and bias may be due to efforts to prove expertise through epistemological techniques (Hartelius, 2008). On the other hand, the worry over bias may also be due to the conservative environment of global warming in a generally conservative, irrigation-dependent state. E. Noelle-Neumann's (1974) theory on the "spiral of silence" supports the latter interpretation, as participants may be fearful to express their opinion in favor of climate change if they feel that it is a minority opinion (see also Schulz-Hardt et al, 2000).

Overall, participants expressed concern that the documents expressed a biased interpretation, and they felt that the CNF reading was more biased than the NL reading. Participants expressed unease over the evidence being biased mostly because of how it would influence others rather than themselves. For example, one participant stated "... if it is pro-change, then it would kind of lead the group to an extent or it is going to turn somebody off in the group right away to the process" (NL/4/5). To account for concern of bias, future research in comparing evidence in different formats may choose a topic that is less political to deter concerns over bias within the evidence.

MULTIPLE FORMATS OF PRESENTATION

Participants agreed that there was no one "best" method for information presentation for deliberations. Participants liked the CNF format even though they felt that it was biased, though they sometimes preferred the "just the facts" presentation of the NL format to help as a quicker and more to-the-point reference in their deliberation. Participants recommended using multiple types of presentation.

NL/2/3: Maybe paired together, both forms in moderation that way you can kind of uh target two different kinds of readers or listeners who are more creative writing, would learn more from it, a story like this versus someone who would do well with the basic facts outlined.

Likewise, one participant stated that reading the NL background document after the CNF document helped her highlight the facts featured in the first document: "...having the information, even though it is more or less the same information even if it is presented twice and on either side of [the post-survey] actually helped me focus more on this textbook style [reading]" (NL/2/6).

The participants pointed out that in their day-to-day activities, they receive information from multiple sources – whether it is social media, television, radio, news articles, friends, school or other sources. Likewise, participants previously received information about climate change in a number of ways, though most often in multimedia or social media formats (see Figure 1). In the same way, they wanted to appeal to this diversity in information sources to be reflected in the deliberative context. In particular, they felt that this would reduce any feelings of bias. One participant commented:

NL/4/8: I would say that unfortunately I don't believe that there is just one method or one way to seek information from people. I look at how I get my information and I don't get it from just one or two sources, I get it from multiple sources and I'm comparing them on a daily basis to see if you know, if anyone skews the story one way or another.

Other participants felt that different types of presentations altogether would appeal to a broader audience.

NL/1/1: Or even just listening to a presentation might hold people's attention better than having them read I guess. Depends on the way they retain information. If you have a good presenter who can kind of make things relatable while presenting all of the important information it might be more interesting and they might be more likely to remember things from it.

Similarly, participants wanted to appeal to visual learners and simplified information with graphs, charts, info-graphics, or videos.

CNF/3/3: Something that would help me with this, and even more if it was more complex information... if you just had like graphs, or maybe not graphs but like a bulleted list that was like “This is the Lincoln Energy Program and This is exactly what it does” you know what I mean? ...[I]t just got kind of confusing and if you were doing something that was even more confusing than this..., I think it would get really hard to follow if it was presented in this form.

CNF/1/4: [With a video]... you could get a lot of this presented and have the different perspectives. You see it on the History Channel or the Nature Channel you know... they show like the 3-4 different perspectives here and I think sometimes you know you read, like I've read all day long -- do I really need to? And other people love to read and they really absorb all that. Other times I really you know, it really hits another type of person sometimes if it's a visual thing right? So I think a nice spin on this and when you think about how the whole world is going YouTube and you know what I mean, online. Not that you have to have them someplace where they watch it on line but at least present a video or something? I think could be pretty effective.

When participants brought up the idea of a video, I asked them whether or not they think that a video format would be more interesting in a story format versus a news format. Their responses were typically that it depended on the person or that they were not sure. One participant stated, “[It] depends ... you get the same thing we had here, [either] it's not reliable enough because it is too much of a story or else it is too dry that it's a PowerPoint that anyone could throw up there” (CNF/4/5). Another participant described the usefulness of documentaries or films to inspire others to think about issues:

CNF/1/3: ... I guess because when I watch a documentary or when I watch a movie and it presents a concept that I don't know about then I'm much more engaged because it's looked at from the individual level... and I actually care about it. I feel like the same would be true if I was watching an environmental movie, if I was seeing the impact that some scientist was having you know, fighting to try and get people to realize that the world is going to end in a fiery horrible mess if we don't do something.”

Discussion

Participants in the present thesis preferred the CNF reading to the NL reading, but many participants stated that using both styles in tandem with one another or increasing the number of presentation styles would be more appealing. For Fisher (1984), the narrative helps create a co-constructed meaning while the rational is epistemic. By combining the rational search for

knowledge and the inclination to make decisions on the emotional level, deliberative participants' mindset can be "framed" for discussion by appealing to both their emotional and rational side.

On the other hand, appealing to various learning styles was also appealing to the study participants. Sunstein (2001) for example, argues that individuals can receive information from a number of sources, and as such, they tend to filter the sources and information. This same concept may also happen with formatting. If it is easier for individuals to digest lists and video clips and info-graphics rather than paragraphs of information, they will tend to filter their information sources in the same manner by which they filter their information.

Some participants thought that even filtering the options and policies for the deliberation would be more helpful. For example, one participant said: "I think it is helpful to give them some options, like "pick the best out of 5 options rather than being like 'Okay, like what do you think?' because I don't know ... That would make it a lot easier for me to pick from than trying to come up with something on my own" (CNF/3/9). On the other hand, some participants wanted the freedom to come up with their own policies altogether, such as when one participant commented, "[t]he other thing about the deliberation is it was always analyzing options that already existed, but it was never like 'are there better ideas that are out there?'" (CNF/1/4).

As such, a best practice for information sharing in deliberative environments is simply capturing the attention of participants to encourage individuals to engage. While many participants liked the idea of a video, they did not feel that it would be the singularly successful way to present information. Some liked the idea of a video paired with an informational document while some liked the idea of short clips and presentations paired with readings. When asked if they would prefer a story-like video or news-like video, participants were decidedly noncommittal and replied with "depends on the person" and "depends on the learning style." Overall, participants thought that pulling from multiple information sources would increase engagement and knowledge, and reduce the concern over bias.

At the same time, Majone (1989) argues that presenting too many options and differences in evidentiary style and format may overwhelm deliberative participants. He warns that evidence should not be too complicated, too data driven, or too broad. When determining the types of evidence presentation, it will be important to decide how to balance simplicity with multiple approaches to evidentiary presentation. While this decision is not unlike the way the instructors must make educational decisions to appeal to different learning styles, deliberative participants often have more limited goals and focus for a policy debate. For example, participants may need to be informed on the broader aspects of sustainability programming and environmental impact but not foreign oil reserves for the purposes of local sustainability policy deliberations.

CHAPTER 5. CONCLUSION

Summary & Purpose of Present Thesis

The present thesis sought to discover how evidentiary presentation, particularly creative presentation, could influence participant use, engagement, and knowledge in deliberative settings. With increasing calls for public input on complex policy issues in areas such as sustainability science, nanotechnology, information technology, and other topics, there is a growing need to share information with deliberation participants in a way that increases knowledge and engagement. Because the use of narrative has been shown to increase engagement and knowledge (e.g. Nussbaum, 1995) is particularly helpful for complex science and technology topics (e.g. Brockman, 1995; Lyne, 2010), this study tested creative nonfiction (narrative) and newsletter (rational) approaches to presenting scientific evidence for a deliberative discussion. By asking participants to participate in a small group deliberation to mimic typical deliberative environments, they were better informed to provide feedback on the process and use of evidence in deliberation. As such, the present thesis set out to answer three primary research questions.

RQ1. How, if at all, does the use of creative nonfiction as a method of information sharing and documentation affect participant engagement?

Participants in the present thesis reported feeling more engaged with the creative nonfiction (CNF) format of evidence presentation than that of the newsletter (NL) method of evidence presentation, though no significant effects were found on the Engagement Scale.⁶ Engagement stemmed from the broadened approach to the topic, emotional connection with the topic, and relatability with the topic. Participants reported that they felt that the readings helped to broaden their approach to the sustainability policy issues at hand. For example, when thinking of local sustainability programs, participants considered the broader implications of sustainability efforts more globally. Participants felt a stronger emotional connection or “pang” with the CNF

⁶ See Appendix 3.

document. In part, the emotional connection was due to the relatability of the narrator and document. Participants reported that the CNF document had a greater emotional and relatability appeal because they were able to put themselves in the narrator's shoes and think about the topics within the constructed social imaginary. In terms of engagement, the creative nonfiction evidence document impacted engagement greater than the newsletter document format.

RQ2. How do participants characterize the experience of background documentation presented in a narrative (creative nonfiction) and/or rational format (newsletter) on deliberative discussions?

Participants described the creative nonfiction document as having more bias but more relatability than the newsletter document. Some participants liked the “just the facts” presentation of the newsletter version of the document because it felt less “fluffy” and more straightforward, which they felt would be more useful for deliberations. On the VoPE Scale, participants said that they “felt creative,” “felt frustrated,” and “gave consideration to all options presented” more so with the CNF document than the NL document. Participants reported feeling slightly more focused in the NL condition than in the CNF condition. Participants were concerned that the creative nonfiction document showed more bias in favor of sustainability programs, and participants demonstrated more opposition to sustainability programs as to not favor global warming. Participants tried to argue for multiple sides of climate change to account for the bias in the document or because they felt their opinion was marginalized compared to others. Overall, the participants' experience with the CNF document showed it to be an easier, more engaging read that was more relatable and inspiring than the NL document. Participants' experience with the NL documents pointed to it being more textbook-like, but they appreciated that it demonstrated “just the facts” and presented the different perspectives more side by side than the NL document.

RQ3. How do individuals use and interpret creative nonfiction evidence or newsletter evidence in a deliberation?

Participants in the deliberation used the details about the local sustainability programs frequently throughout the deliberation, but they referred to the background information much

less. Often, participants used their own experiences and opinions in shaping their deliberation, though they thought that the evidence was useful in setting them up to think more broadly about program and policy impacts. When weighing in on how evidence would be better utilized in a deliberation, participants suggested a combination of the approaches or using new approaches such as videos or expert presentations to help capture the attention of the audience and increase knowledge. For the purposes of the deliberation, participants would have preferred a quick-reference guide such as a table, chart, or other info-graphic describing basic programmatic details and impacts. A few participants commented that the broad-based information on global environmental science would have been more impactful if it detailed the impact on their “own generation” more precisely.

Theoretical Contribution

The present thesis sought to answer calls for additional research on evidence in deliberative environments (e.g., PytlikZillig & Tomkins, 2011), with special consideration to the need for engaging and attention-grabbing evidence. I employed the use of creative nonfiction in particular to further test if Fisher’s (1989) claim that using narrative in conjunction with rational argument improves deliberative results. Like Gutkind (2012) or Brockman’s (1995) approach, I attempted to show creative presentation of evidence would increase the attention, knowledge, and engagement with a given topic. While participants reported feeling more engaged with the CNF evidence and that they generally preferred to read the CNF evidence, the approach was not universally lauded.

Potentially, the evidence presentation in this study was not braided enough – the CNF document seemed too scientific when participants preferred variation in presentation. In Nussbaum’s (1995) study of the impact of novels on judge’s decisions, the braiding of rational courtroom arguments with the literary imaginary of the novel is affected by the participants’ reasoning rather than by the study itself. While Nussbaum showed that novels impacted reasoning by influencing the imaginary, participants in the present study reported that the

background information in general helped them think more broadly about the local programmatic impact. Participants in this thesis presented a need for diversified presentation of evidence with a focus on more visual materials (e.g. video, graphs).

This study does not prove one approach or set evidence-based methods for evidence presentation in deliberative environments. Rather, this study shows that the modes of evidence are important and that when varying modes of evidence presentation are used, deliberative materials can be more engaging and transformative, yielding long-term knowledge and insightful influence on policy decisions. Multiple studies of deliberation test out various modes of information presentation, but very few show how multiple approaches can affect participants. While a braided approach is useful, the approach must also be interesting to participants. As Couldry, Livingston, and Markham (2007) write, one must first get an individual's attention to entice them to engage. The present study builds on theoretical tests of information presentation and evidence and deliberation by showing that braiding multi-modal approaches, from *both* narrative and rational perspectives, may best serve participants that already receive information in multiple formats from multiple sources on a daily basis.

Limitations and Directions of Future Research

The present study was limited in that it tested on two types of information sharing: creative nonfiction and newsletter formats. Further research should be pursued to test additional methods such as those methods as detailed by the participants, including a combination of techniques (though heeding Majone's (1989) warning of too many experiments in one deliberation) and use of new techniques such as expert presentations and video. An ideal future construction of this study could include a narrative video versus news format video using the same questions.

Another limitation of this study was the saturated or polarized nature of the topic. Environmental science, while timely and important (e.g. Togerson, 1999; Cox, 2013), is highly politicized, which may detract from the overall goal of the study. One participant complained

that she hears a lot about global warming and climate change already, while another participant wanted a topic that he “was more interested in” (CNF/3/1). Future studies could include more complex topics such as nanotechnology, robot technology, or genomics. Using such high technology topics may change the approaches to evidentiary presentation. For a topic as complex as nanotechnology, a “fictional future” format that present hypothetical considerations for deliberations may prove more useful in helping the relatability of complex topics and a deeper braiding of narrative and rational paradigmatic approaches.

A third limitation of this study was its sample size. While the sample size was ideal for focus groups, greater pre- and post-survey data could have collected for significance between conditions. A similar test has been held online with several hundred respondents using online information sharing of the similar CNF and NL documents⁷. Timestamp data showed that the materials were not being read, and thus could not fully be analyzed or controlled for engagement. The present thesis study was ideal in controlling for readings completed by participants, for which online tests cannot fully control. As such, this study focused more on the qualitative feedback, gathering participant comparison and contrast between documents, rather than quantitative input.

Applications of Current Study Findings

The present study may be directly applied to current deliberative processes. From the participants, I learned that relatability, engagement, and fairness are important factors in participant analysis of evidentiary presentation. When designing informational materials and background documents for deliberative participants, researchers and deliberative designers should work to create diverse materials that follow these three characteristics. While not all participants preferred the CNF or NL documents, a combination of approaches that also featured a “quick reference” list of key facts directly related to the deliberative issue at hand would be of use to participants. Whether it is through oral presentation, narrative, video, and/or discussion to help

⁷ PytlikZillig et al 2012 study.

participants “put themselves in someone else’s shoes,” materials to stimulate deliberation should work to tie emotion in with the information sharing. While there is no “best practice” for deliberative discussions or the informational tools used in them, the present thesis study provided an introductory analysis into how informational materials can be used and shaped for deliberative discussions.

Conclusion

In conclusion, the present study’s findings indicate that informational evidence for deliberative discussions is an important area of study, particularly for complicated or politicized science and technology issues. Findings of the present study build on research in transformative engagement, public deliberations, third-culture braiding of science and humanities, and decision-making characteristics. As policymakers increase the calls for public participation in policy decisions related to science and technology, the need for accurate, engaging, and relatable evidence also increases. As a whole, the findings of the present thesis study help to provide insight as to how evidence can be used, interpreted, and built for public deliberations surrounding complex science and technology issues. Further development of these findings may influence how evidentiary presentation can lead to knowledge gains, attitude change, and citizen engagement. Multiple formats of evidence presentation should be applied to appeal to a new type of participant who receives information not simply from the morning news, but from the television, social media, newspaper, books, blogs, photos, online video sharing, and more.

APPENDIX LIST

1. Recruitment Script
2. Schedule of Questions
 - a. Pre Survey
 - b. Objects of Analysis
 - c. Group Deliberation
 - d. Post Survey
 - e. Focus Group Questions
3. Engagement Scale Results
4. Bibliography

APPENDIX 1. RECRUITMENT SCRIPT

Using Creative Non-Fiction as a Means of Presenting Scientific Information (Study 2)

Recruiting Script

We are interested in learning more about public participation and engagement with policy issues surrounding science and technology problems. This study will test whether altering the presentation of information in a creative way leads to changes in engagement and learning. Your knowledgeable input will help us understand how residents make sense of policy level topics using different approaches in a group setting.

In order to participate in this study you must:

- 1) Be a current resident of Lincoln, Nebraska, and
- 2) Be at least 19 years old.

You will be asked to participate in one structured focus group in person, lasting approximately 90 minutes, with a member of the research team. If you'd rather not participate in the research interview, please let us know and we will respect your wishes.

For participating in this research, you will receive \$10 in compensation. Students are eligible for extra credit as provided by their course.

You will be asked to read and sign a consent form before taking part in the focus group. Focus group data and identifying information will be confidential. Your participation, non-participation, or withdrawal from this study will not affect your relationship in any way with the your relationship with the researchers, the University of Nebraska-Lincoln, or any other entities associated with this research, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

If you have any questions, please contact us.

Primary researcher: Janell Walther, (402) 472-2762, jwalther2@nebraska.edu

Researcher: Lisa PytlikZillig, PhD (402-472-6877) lpytlikz@nebraska.edu

Researcher: Damien Smith Pfister, Ph.D., 402-472-0646, dpfister2@unl.edu

APPENDIX 2. SCHEDULE OF QUESTIONS

Survey questions are adapted from the *Using Creative Non-Fiction as a Means of Presenting Scientific Information Energy Policy Survey and Community Conversation* designed by PytlikZillig et al, 2012.

PRESURVEY

First, we'd like to ask you a few questions about your level of exposure to information about climate change generally. Think about your exposure to information about climate change in the past year.

1. How much have you heard or learned about climate change and related topics (e.g., global warming, glacial melting) in the past year? Circle one.

Nothing at all A little Some Quite a bit A great deal

2. Where did you hear or learn about climate change and related topics?

Indicate the extent to which you heard or learned about climate change and related topics from the following sources in the past year.

	Not at all	A little	Some	Quite a bit	A great deal
Multimedia (e.g., TV, radio, documentaries, mobile apps)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media (e.g. blogs, Facebook, Twitter, YouTube videos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Text material (e.g., magazines, news articles, books, journal articles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social settings (e.g., conversations with family, friends, acquaintances)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formal learning (e.g., classes, schools, workshops)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informal learning (e.g., museums, zoos, public events)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work situations (e.g., at work, or as part of work you do)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community situations (e.g., clubs or groups to which you belong)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify: _____)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Personally, how well informed do you feel you are about how the Earth's "climate system" works?

Not at all
informed

Not very well
informed

Fairly well
informed

Very well
informed

4. Global warming refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result.

What do you think? Do you think that global warming is happening?

Yes, definitely Probably Yes Probably Not No, definitely not Don't know

5. On some issues people feel that they have all the information they need in order to form a firm opinion, while on other issues they would like more information before making up their mind.

For global warming, where would you place yourself?

- ☐ I need **a lot** more information
- ☐ I need **some** more information
- ☐ I need **a little** more information
- ☐ I **do not need any** more information

6. Please indicate whether you think the following are True or False.

	Definitely False	Probably False	Probably True	Definitely True	Don't Know
Increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to global climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Human activity, including industry and transportation, is a significant cause of climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
If global warming occurs, it will increase crop yields in some places, and decrease it in others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Currently observed climate change is mostly due to normal climate patterns.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
The Earth's climate is warmer now than it has ever been before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Compared to the climate of the past one million years, the last 10,000 have been unusually warm and stable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
If humankind suddenly stopped producing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

	Definitely False	Probably False	Probably True	Definitely True	Don't Know
carbon dioxide today, climate change and global warming would still continue for many years.					
Over time, any climate change that happens will be more beneficial than harmful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

7. Public opinion polling has shown that when it comes to climate change, the population is roughly divided into the following 6 different categories. Right now, which descriptor best describes how you feel about climate change?

- ☐ Alarmed
- ☐ Concerned
- ☐ Cautious
- ☐ Disengaged
- ☐ Doubtful
- ☐ Dismissive

8. In your opinion, what is the risk of climate change exerting a significant impact on...

	No risk at all	A slight risk	A moderate risk	A high risk	A very high risk
... <i>public health</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... <i>economic development</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... <i>nature</i> , that is, the natural <i>environment</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank You! *When you are finished, please give this survey to your small group leader.*

OBJECTS OF ANALYSIS: CREATIVE NONFICTION

Lincoln's Energy Plan: The Broad Context

One important goal for the Sustainable Lincoln Energy Plan is to save taxpayer money now. Another is to ensure steady and sustainable sources of energy for the future. While today's energy savings are relatively easy to calculate and understand, looking to the future is more difficult. This is especially true given recent concerns about climate change.

Because climate change has been the source of considerable debate in both the political and social realms, the first part of this document is a story about a journalist who is exploring the broad context and varying viewpoints around questions such as the following: What impacts does human energy use have on the climate? What are the implications for society, the environment, and the Earth as a whole? This story offers a glimpse into some of the more nuanced perspectives offered by scientists—and one journalist—grappling with these questions. Our hope is that this background will set the tone for an open and respectful discussion about points of common interest, even among people with differing views.

Just a Minute! Fix the Planet?

ONE STIFLING AUGUST AFTERNOON⁸ in Omaha's Old Market, as I minced my way through a constellation of molten chewing-gum smears, I was blindsided by a kid with a clipboard who asked: "Do you have a minute for the environment?" "Huh?" I snapped, surprised at the unexpected intrusion. "What exactly do you mean by that?"

The kid, Jared Dubin, a 19-year-old from Kearney, explained that he was working for a local environmental group pushing a Congressional cap-and-trade bill, touted as a way to create a marketplace for carbon dioxide emissions, which in turn would motivate corporations to curb greenhouse gasses and, with luck, ultimately help reign in global warming. He had taken this \$7.25-an-hour assignment in part because it sounded like a cool cause, but, after four weeks of confronting a variety of rude and disinterested people, he was feeling burned out. He'd learned a few things and had had all kinds of conversations—some crazy, some offensive and a few satisfying and provocative. I guess he was hoping for the satisfying kind from me.

⁸ This excerpt was adapted from Eric Hagerman's piece "Just a Minute," published in the literary journal, *Creative Nonfiction* (Spring 2010).

“Do you really think we can ‘fix’ the planet?” I asked. I admit I had never given this question a lot of thought. Most people don’t ponder such big issues—especially as they are walking innocently down the street. But, now that he had my attention, the idea intrigued me.

“It’s more of a course correction,” he allowed. “Obviously we’re not going to get the planet back to where it was. But if we don’t do anything, it’s going to get a lot worse.”

I really didn’t offer much of a response. But I admit, that kid got me wondering. Is our planet really broken? Could it be fixed? And what would it really mean for the Earth to die? This was deep stuff, for sure.

Over the next few days, I couldn’t seem to get these questions out of my mind—I get kind of obsessive that way—so I went to see an acquaintance, the director of the University of Nebraska’s National Drought Mitigation Center, Dr. Mike Hayes. We met in the first floor lobby over a fifty-cent cup of honor-system coffee dispensed from a silver brewer tagged with a handwritten warning, “Taste first! Add hot water if too strong.” We both drank ours straight.

“Thanks for meeting with me on such short notice,” I told him. “Oh, no problem, no, no, really, this is what we do,” he said, waving off my gratitude as he pulled up a chair. “So how can I help you?” “The climate,” I answered. “People keep complaining about it. A few days ago I was practically accosted by a kid with a clipboard worrying about global warming. Tell me how it works.”

“How the climate works?” Hayes asked with a laugh. “We have a whole series of courses on that topic, each of which are a semester long.” Then, sensing that I wasn’t joking, he added, “But I can cover a few highlights.”

Hayes described how current understanding revolves around an elaborate model of deep ocean currents that transfer heat and salt around the globe on a 1,000-year cycle, a vast “conveyor belt” that has a major effect on climate. “The ocean has a big influence on climate,” Hayes said. “And the difference in the amount of carbon dioxide and heat held by the ocean



compared to the atmosphere is *HUGE*.” Indeed, the climate has been described as a slave to oceans, which store 60 times as much carbon dioxide and 800 times as much heat as the atmosphere.

Hayes also said that climate scientists have been trying to explain how past climates have occasionally shifted seemingly outside the realm of natural cycles, more abruptly than anyone thought possible. The temperature decreases that brought on the last pronounced glacial period happened in less than 100 years—almost Hollywood fast. Some climate scientists believe that period was the result of a sudden, mysterious “jamming” of the ocean conveyor belt. Related to current times, some scientists are concerned that the rate at which we're changing the concentration of carbon dioxide in the atmosphere could trip some hidden switch that sends the whole system reeling.

“So do you think that humans are impacting the climate?” I asked. I had expected him to pause and think about my question, maybe even taking a moment to clean his glasses or get another cup of fifty cent coffee while pondering. Instead, Hayes just shrugged and said, “Yes. Of course.”

Hayes then pointed out that some scientists have gone so far as to argue that human beings have become a geological force in our own right, physically altering the biosphere so profoundly that we merit our own geological epoch: the Anthropocene—from “anthropo” for “human,” and “-cene” for “new”—a term coined a decade ago by Nobel laureate chemist Paul Crutzen. Crutzen’s rationale: Humans have disturbed 30 to 50 percent of the planet's surface, increased our population tenfold in three centuries and changed the balance of atmospheric carbon dioxide in ways that will linger for tens of thousands of years.

“Because these human-induced effects are taking us where we have not been before, it is possible that a significantly large climate change will stress ecosystems in such a way that many species will struggle to survive,” Hayes pointed out. “Some scientists believe that a mega-extinction of species may result.”

I had hoped that meeting with Hayes would stop my obsession, but instead, now I couldn't get the thought of mega-extinction out of my mind. I wondered: Is this what it would mean for Earth to die?

Rather than bothering Dr. Hayes again, I decided to bother someone else. My question seemed perfect for James Kasting, an atmospheric scientist at Penn State. In 1992, he and his colleague Ken Caldeira published “The Life Span of the Biosphere Revisited” in which they predicted that—regardless of human activity—95% of life

forms will go extinct in 500 million years and, 1.2 billion years from now, the planet will be completely uninhabitable.

The oceans will actually go first, Kasting said when I visited him. Why? Kasting explained that the physics of the sun are comfortably predictable: The sun is getting brighter all the time, at a rate of about 1% every 100 million years or so. As the Earth's surface heats up, evaporation and rainfall increase, speeding up the weathering of silicate rock, which draws down carbon from the atmosphere, resulting in a cooling effect. (Don't get excited, warns Kasting: "It's too slow to help us with global warming in the short term.") It's a self-regulating thermostat that, Kasting says, explains why our planet's porridge has been pretty close to perfect for billions of years. But at some point, many millions of years in the future, and regardless of what humans do, this thermostat will break: Temperatures will skyrocket, and the oceans evaporate. "Once the oceans are lost, the Earth is dead," Kasting said.

Jared said he bombed as a canvasser. He now thinks that the cap-and-trade bills "stink" and that politics alone probably isn't the answer to weaning our society from fossil fuels. "Until people get up and go to Washington, and make it seem like this is something that people really care about, politicians are going to do what's comfortable," he said. "It's easy to give just a minute of your time, but it is going to take more work than that."

Jared seems willing to do some of that heavy lifting, but he's also savvy enough to know that revolting would be a waste unless he knows what he's fighting for. What is he—or any of the rest of us—supposed to make of the conflicting predictions from the scientific world? For instance, some prominent climate scientists insist that we're doomed if the world doesn't stop burning coal now, but others see that prospect as an improbability. Some scientists believe we can recapture carbon from the atmosphere and eventually lower carbon dioxide concentrations. An astronomer named Roger Angel, a member of the National Academy of Sciences (read: "not a kook"), even suggests that we build a solar shield in space to reflect the sun's warming rays.

Despite the unavoidable uncertainties, Jared seems optimistic about the Earth's chances. That attitude should come in handy since his generation will probably get stuck with the bulk of the work I suspect it will take for us to adapt to the environment we're so dramatically reshaping. You could say, of course, that adapting is what we've always done—but doesn't "always" imply forever? Let's not assume that just because the Earth will be around for long enough to count as forever, we're guaranteed to be part of the picture. "We've got to survive," Lovelock told me, almost imploring. "We're a pretty

useful species, and it would be an appalling loss to the planet—after waiting three and a half billion years to get us—if we go and knock ourselves off. Because it's taken the planet that long time to evolve a species who can think and talk, and who can go out in space and see what a marvelous planet it is.”

Lincoln's Energy Conversation

As we hope you can see from reading about the views of a few prominent scientists—there are many unanswered questions when it comes to climate change. Agreement does exist on some vital points. For example, surveys and literature reviews consistently show that the large majority of climate scientists⁹ agree that global temperatures are increasing as a result of human activities, and will continue to do so for many years in the future. However, the impacts and effects of that warming are much more difficult to predict. Even if the impacts were known, deciding what to do—that is, options for adapting—involves discussion of personal values, and can only be informed, but not decided, by science.

It is in that spirit that we invite you to discuss the energy portion of the Sustainable Lincoln Plan with your neighbors and local officials. The City of Lincoln believes that democracy functions best when citizens engage in open-minded discussion and seek common ground. While we may differ in party affiliation or disagree about global warming, some facts that we all can probably agree upon include the following:

- Lincoln's demand for energy will continue to increase over time as the City grows.
- Improving energy efficiency is a cost-effective means of meeting demand while preserving low prices.
- Renewable sources of energy are likely to be less volatile and less expensive than conventional fossil fuels in the near future.
- Collective action is most likely to succeed when it is embraced by a clear majority of the public.

⁹ Estimates vary from survey to survey, but consistently show overwhelming support. For instance, a survey of climate scientists in 2003 by Bray and von Storch found that 82% agree “we can say for certain” that climate change is already underway. (http://w3k.gkss.de/staff/storch/pdf/GKSS_2007_11.pdf). Another survey published by Doran in 2009 indicated that 96.2% of climate specialists agree that mean global temperatures have risen over the past 200 years and 97.4% believe that human activity is a significant contributor to global warming. (abstract available here: <http://www.agu.org/pubs/crossref/2009/2009EO030002.shtml>)

Energy Programs in Lincoln and Nebraska

Current activities concerning sustainable energy use in Lincoln can be broken down into a number of categories.

- **Incentive Programs:** These programs offer financial incentives to purchase energy upgrades for residents and businesses.

One example of this type of program is the Sustainable Energy Program developed and administered by Lincoln Electric System (LES). This year, LES will spend a total of \$3 million helping customers to purchase high-efficiency heat pumps and air conditioners, improve home insulation, and retrofit commercial and industrial lighting fixtures.¹⁰ In addition, the American Recovery and Reinvestment Act provided a one-time federal grant to establish the reEnergize Program, a collaborative effort between Omaha and Lincoln that is expected to provide professional energy evaluations and upgrades to at least 700 residences in Lincoln by May 2013.¹¹

- **Upgrading City Assets:** These programs focus on reducing the City's energy use by making sure that City assets are energy efficient.

As an example of programs that focus on upgrading City assets, Cleaner Greener Lincoln has spearheaded a comprehensive effort to improve the energy efficiency of government buildings and other assets.

These efforts included funding lighting upgrades for nine city buildings, upgrading city traffic lights to more efficient LED bulbs, and partnering with Black Hills Energy to develop new sustainable building standards for the city. Replacing city traffic lights alone saves the city approximately \$70,000 annually on energy costs.¹²

- **Encouraging Private Sector Efficiency:** Programs that focus on encouraging private sector efficiency are those that encourage private businesses and residents to use less energy.

As an example of programs that encourage energy efficiency among private residents, the Lincoln Energy Challenge encouraged residents to take steps to cut down on their energy use. Nearly 2,000 residents participated in the 2011 Lincoln Energy Challenge, pledging actions that would reduce carbon dioxide emissions by over

¹⁰ You can read more at http://www.les.com/your_les/SEP/sustainable_energy_program.aspx

¹¹ You can learn more about this program by visiting reenergizeprogram.org.

¹² You can read more about Cleaner Greener Lincoln's efforts to upgrade City assets at <http://lincoln.ne.gov/city/mayor/energy/green-city.htm>

500,000 lbs a year.¹³ Cleaner Greener Lincoln has also stepped up to help thirteen non-profit buildings to purchase professional energy audits and provided significant lighting updates for eleven of the thirteen buildings.

- **Assistance to Low-Income Families:** These programs offer financial support to low-income families looking to improve the energy efficiency of their homes.

One example of this type of program is the Low-Income Weatherization Assistance Program which is currently overseen by the Nebraska Energy Office and funded by a Recover Act grant. Since receiving this grant in 2010, this program has helped weatherize more than 4,243 homes statewide, including 351 in Lancaster and Saunders counties. Homes at or below 200 percent of the federal poverty level qualify for the assistance in this program, which helps decrease the family's monthly energy budget while reducing demand on existing power plants. Federal funding for this program is set to expire in 2013.¹⁴

- **Low-Interest Energy Loans:** These programs offer low-interest loans for the purchase of new energy improvements.

One example of this type of program is the Dollar and Energy Saving Loans program overseen by the Nebraska Energy Office. This program offers loans at subsidized interest rates of 2.5%, 3.5% and 5% for projects such as replacing appliances, installing new heating and cooling units, upgrading light fixtures and installing wind or solar cells for the production

¹³ You can read more about Lincoln's Energy Challenge at <http://lincoln.ne.gov/city/mayor/energy/pledge.htm>

¹⁴ Learn more at <http://www.neo.ne.gov/wx/wxindex.htm>

OBJECTS OF ANALYSIS: NEWSLETTER

Lincoln's Energy Plan: The Broad Context

One important goal for the Sustainable Lincoln Energy Plan is to save taxpayer money now. Another is to ensure steady and sustainable sources of energy for the future. While today's energy savings are relatively easy to calculate and understand, looking to the future is more difficult. This is especially true given recent concerns about climate change.

Because climate change has been the source of considerable debate in both the political and social realms, the first part of this document aims to provide a broad context and recognize that people at the discussion will likely have varying viewpoints around questions such as the following: What impacts does human energy use have on the climate? What are the implications for society, the environment, and the Earth as a whole? This document offers a glimpse into some of the more nuanced perspectives offered by scientists grappling with these questions. In case you would like to read more about the points raised in this background document, we have included footnotes with links to additional information. Our hope is that this background will set the tone for an open and respectful discussion about points of common interest, even among people with differing views.

Just a Minute! Fix the Planet?

Sometimes sustainability efforts are viewed as measures that “greenies” take in order to stop global warming, or to “fix” the environment.¹⁵ This is how many see cap-and-trade bills, Congressional legislation touted as a way to create a marketplace for carbon dioxide emissions, which in turn would motivate corporations to curb greenhouse gases and, hopefully, ultimately help reign in global warming. Therefore, some people feel resistant to discuss “sustainability.” They might ask: What would it really mean to “fix” the planet or environment? What would it even mean to have it be broken? Who says it's broken anyway?

¹⁵ This section is comprised of adapted excerpts from Eric Hagerman's article, titled “Just a Minute,” published in the literary journal, *Creative Nonfiction* (Spring 2010).

The Earth's Conveyor Belt

We visited with Dr. Mike Hayes, a climatologist and current director of the University of Nebraska's National Drought Mitigation Center. Dr. Hayes told us how the analogy of a "conveyor belt" can be used to describe an elaborate model of deep ocean currents that transfer heat and salt around the globe



on a 1,000-year cycle. These cycles have a major effect on climate. Indeed, the climate is greatly affected by the oceans, and there is a large difference in the amount of carbon dioxide and heat held by the ocean compared to the atmosphere. The oceans store 60 times as much carbon dioxide and 800 times as much heat as the atmosphere.¹⁶ Related to this, climate scientists have been trying to explain how past climates have occasionally shifted seemingly outside the realm of natural cycles and more abruptly than anyone would have thought possible.¹⁷ The temperature decreases that brought on the last pronounced glacial period happened fast—in less than 100 years. Some climate scientists believe that period was the result of a sudden, mysterious “jamming” of the ocean conveyor belt.

Related to current times, some scientists are concerned that the rate at which we're currently changing the concentration of carbon dioxide in the atmosphere could change the whole system.¹⁸ While it may seem unbelievable that humans could have such an impact on the environment, some scientists have gone so far as to argue that human beings have become a geological force in our own right, physically altering the biosphere so profoundly that we merit our own geological epoch: the Anthropocene—from “anthropo” for “human,” and “-cene” for “new”—a term coined a decade ago by Nobel

¹⁶ See the following article on the possible effects of rising CO2 levels in the oceans: [National Science Foundation. 2004. Impact Of Earth's Rising Atmospheric Carbon Dioxide Found In World Oceans.15 July 2004. \(http://www.nsf.gov/news/news_summ.jsp?cntn_id=100401\)](http://www.nsf.gov/news/news_summ.jsp?cntn_id=100401)

¹⁷ See this article for perspectives on abrupt climate change and describing the ocean conveyor belt: [Jeremy Hsu. 2012. Making Sense of Abrupt Climate Change, or What Would Yoda Do? Vol. 23, Issue 3. March 2012. \(http://www.jvi.org/features/ft.php?id=446\)](http://www.jvi.org/features/ft.php?id=446)

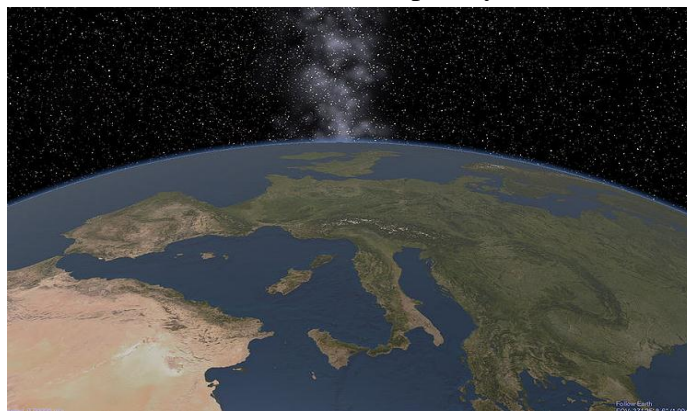
¹⁸ See this article on the varying probability of such an event: Richard A. Kerr. 2005. Confronting the Bogeyman of the Climate System. *Science*, Vol. 310, Issue 21. October 2005. (<http://www.sciencemag.org/content/310/5747/432.full.pdf>)

laureate chemist Paul Crutzen.¹⁹ Crutzen's rationale: Humans have disturbed 30 to 50 percent of the planet's surface, increased our population tenfold in three centuries and changed the balance of atmospheric carbon dioxide in ways that will linger for tens of thousands of years. Dr. Hayes notes that because human-induced effects are taking us where we have not been before, it is also possible that a significantly large climate change will stress ecosystems in such a way that many species will struggle to survive. Some scientists even believe that it is possible for a mega-extinction of species to take place as a result.²⁰

The Earth's Thermostat

Another analogy views Earth's systems as operating like a "self-regulating thermostat." In 1992, the atmospheric scientist James Kasting and his colleague Ken Caldeira published a monumental paper in the journal *Nature* in which they predicted that—regardless of human activity—95% of all life forms will go extinct in 500 million years and, 1.2 billion years from now, the Earth will become completely uninhabitable.²¹

According to Kasting and Caldeira, the oceans will disappear first. They explain that the physics of the sun are comfortably predictable: The sun is getting hotter and brighter all the time, at a rate of about 1% every 100 million years or so. As the Earth's surface heats up, evaporation and rainfall increase, speeding up the weathering of silicate rock, which draws down carbon from the atmosphere, resulting in a cooling effect. Kasting and Caldeira describe this process as Earth's "self-regulating thermostat," and consider it responsible for maintaining a temperature that has been hospitable to life for billions of years. (However, they note that this process is far too slow to help with global warming in the short term.) Their model predicts that at some point, many millions of years in the future, and regardless of what humans do, this thermostat will break. At this point, temperatures will rapidly soar, the oceans will evaporate, and the Earth will be dead.



¹⁹ P Crutzen and E Stoermer. 2000. The "Anthropocene." Global Change Newsletter, Vol. 41, Issue 1. (abstract available here: <http://www.mendeley.com/research/the-anthropocene-4/>)

²⁰ See the following article on evidence of a new Anthropocene epoch and its effects: [Howard Falcon-Lang. 2011. Anthropocene: Have humans created a new geological age? BBC, May 10 2011. \(http://www.bbc.co.uk/news/science-environment-13335683\).](http://www.bbc.co.uk/news/science-environment-13335683)

²¹ [K Caldeira and J Kasting. 1992. The lifespan of the biosphere revisited. Nature, Vol 360, 31 December. \(http://www.msri.org/people/members/2008cc/Projects/Project_5B_Ice_Core_EMD/Kasting_1992_Geobiology.pdf\).](http://www.msri.org/people/members/2008cc/Projects/Project_5B_Ice_Core_EMD/Kasting_1992_Geobiology.pdf)

Distinct Perspectives

These perspectives—one that sees the oceans as a conveyor belt that humans might jam and another which depicts Earth systems as a thermostat that will eventually break no matter what humans do—illustrate different viewpoints related to “saving” or “fixing” the planet. The climate system is incredibly complex and many people struggle to understand the meaning of conflicting predictions from the scientific world. For instance, some prominent climate scientists insist that we’re doomed if the world doesn’t stop burning coal now,²² but others see that prospect as an improbability.²³ Some scientists believe we can recapture carbon from the atmosphere and eventually lower carbon dioxide concentrations.²⁴ An astronomer named Roger Angel, a member of the National Academy of Sciences, further argues that we can build a solar shield in space to reflect the sun’s warming rays.²⁵

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As we hope you can see from reading about the views of a few prominent scientists—there are many unanswered questions when it comes to climate change. Agreement does exist on some vital points. For example, surveys and literature reviews consistently show that the large majority of climate scientists²⁶ agree that global temperatures are increasing as a result of human activities, and will continue to do so for many years in the future. However, the impacts and effects of that warming are much more difficult to predict. Even if the impacts were known, deciding what to do—that is, options for adapting—involves discussion of personal values, and can only be informed, but not decided, by science.

It is in that spirit that we invite you to discuss the energy portion of the Sustainable Lincoln Plan with your neighbors and local officials. The City of Lincoln

²² “NASA warming scientist: ‘This is the last chance.’” USA Today, 24 June 2008.

(http://www.usatoday.com/tech/science/environment/2008-06-23-globalwarming_N.htm)

²³ Bill McKibben: [Remember This: 350 Parts Per Million](#). Washington Post, 28 December 2007.

(http://www.natcapsolutions.org/Presidio/Articles/Climate/RememberThis_MCKIBBEN_25xii07.pdf)

²⁴ John Tierney. 2009. [Scrubbing the Atmosphere](#). New York Times, September 24 2009.

(<http://tierneylab.blogs.nytimes.com/2009/09/24/scrubbing-the-atmosphere/>).

²⁵ Scientists to stop global warming with 100,000 square mile shade. The Telegraph (UK). 26 Feb 2009.

<http://www.telegraph.co.uk/earth/environment/globalwarming/4839985/Scientists-to-stop-global-warming-with-100000-square-mile-sun-shade.html>

²⁶ Estimates vary from survey to survey, but consistently show overwhelming support. For instance, a survey of climate scientists in 2003 by Bray and von Storch found that 82% agree “we can say for certain” that climate change is already underway. (http://w3k.gkss.de/staff/storch/pdf/GKSS_2007_11.pdf).

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As an example of programs that focus on upgrading City assets, Cleaner Greener Lincoln has spearheaded a comprehensive effort to improve the energy efficiency of government buildings and other assets.

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²⁹ Learn more about Cleaner Greener Lincoln's efforts to upgrade City assets at <http://lincoln.ne.gov/city/mayor/energy/green-city.htm>

³⁰ Learn more about Lincoln's Energy Challenge at <http://lincoln.ne.gov/city/mayor/energy/pledge.htm>

³¹ Learn more at <http://www.neo.ne.gov/wx/wxindex.htm>

DELIBERATIVE DISCUSSION

When your group has finished reading the materials, please discuss the following questions with each other. Select one member of your group to serve as the recorder for your responses.

1. Program Priorities

Below are the four categories representing current activities in the Lincoln Sustainable Energy Plan.

Discuss these activities with your group. How would your group rank these programs? To provide more detail on your priorities, rank these programs in order of MOST IMPORTANT to fund (FIRST) to least important to fund (last). You may decide to rank programs based on consensus or by vote.

- ☐ Sustainable Energy Program
- ☐ reEnergize Program
- ☐ Upgrading City Assets
- ☐ Encouraging Private Sector Efficiency

It would be very helpful if you explained *why* your group ranked certain programs higher or lower than others above. Please explain below.

2. Potential Funding Sources

The following questions are designed to measure the intensity of your stated preferences for sustainable energy programs and how these compare to your preferences for other city functions.

Please discuss these questions with your group, and tell us which stance your group took.

- A.** Do you think the city should continue to finance Cleaner Greener Lincoln after federal funding expires in 2013? **(Yes/No)**
- B.** Would you be willing to sacrifice some city services (for instance, a shorter season for public swimming pools or fewer hours of operation at public libraries) in exchange for increased city efforts to improve energy efficiency and renewable production? **(Yes/No)**

- C. Would you be willing to pay higher property taxes to support sustainable energy programs in Lincoln? (Yes/No)
- D. Would you be willing to pay higher electricity rates to support sustainable energy programs in Lincoln? (Yes/No)

3. Below is a list of five commonly cited goals of sustainable energy programs. Please rate them according to how important you think each object is.

Then, rank the objective you feel is MOST IMPORTANT #1 and the objective you find LEAST IMPORTANT #5.

	Not important at all	A little important	Somewhat important	Quite important	Very important	Ranking
Keeping my monthly electricity bill low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Curbing greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Saving taxpayer money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Reducing our dependence on foreign oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Helping low-income families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Other (please specify): _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

If you are willing, please comment on why your group chose to rate and rank these objectives as you did. Be sure to comment on anything you or your group may have heard today that influenced, changed, or reinforced your opinions.

4. How important is it to you to have sustainable energy programs continue at the city level after federal funding for Lincoln's activities expires in 2013?

- ☐ Not important at all
 ☐ A little important
 ☐ Somewhat important
 ☐ Quite important
 ☐ Very important

5. How much would you be willing to pay MONTHLY to support sustainable energy programs like the ones described earlier?

\$ _____ per month

Optional Questions:

1. Would you be willing to pay higher sales taxes to support sustainable energy programs in Lincoln? (Yes/No)
2. For each program area, indicate how important your group thinks it is that programs such as these exist at the city level (i.e., using city funds and efforts to support the programs). Then, rank the program area you feel is MOST IMPORTANT to exist at the city level #1, and the program area you feel is LEAST IMPORTANT to exist at the city level #5.

	Not important at all	A little important	Somewhat important	Quite important	Very important	Ranking
Assistance to low-income families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Encouraging private sector efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Incentive programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Low-interest energy loans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Upgrading city assets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

If you are willing, please comment on why your group chose to rate and rank these programs as you did. Be sure to comment on anything you or your group may have heard today that influenced, changed, or reinforced your opinions.

3. Was there consensus or disagreement in your group about these questions? Why or why not?
4. Did you respond to any questions by vote? Which questions?
5. Which of these questions caused the most disagreement in your group?

POST TEST

ABOUT YOU

1. We are interested in knowing a little about the preferences and beliefs of people attending today's deliberation. Please answer the following.

	Strongly Disagree	Disagree	Neutral/No Opinion	Agree	Strongly Agree
A good citizen should be willing to justify their political views.	SD	D	N	A	SA
I follow political and social issues because I want to learn more things.	SD	D	N	A	SA
I believe most people try to be fair.	SD	D	N	A	SA
A good citizen should allow others to challenge their political beliefs.	SD	D	N	A	SA
I consider myself well-qualified to participate in politics.	SD	D	N	A	SA
I really enjoy a task that involves coming up with new solutions to problems.	SD	D	N	A	SA
I believe that others have good intentions.	SD	D	N	A	SA
A good citizen should listen to people who disagree with them politically.	SD	D	N	A	SA
I follow political and social issues because I think it's important.	SD	D	N	A	SA
A good citizen should discuss politics with those who disagree with them.	SD	D	N	A	SA
If a citizen is dissatisfied with the policies of government, he or she has a duty to do something about it.	SD	D	N	A	SA
I follow political and social issues because that's what I'm supposed to do.	SD	D	N	A	SA
I like to have the responsibility of handling a situation that requires a lot of thinking.	SD	D	N	A	SA
I try to anticipate and avoid situations where there is likely a chance I will have to think in depth about something.	SD	D	N	A	SA
I trust what people say.	SD	D	N	A	SA
I usually end up deliberating about issues even when they do not affect me personally.	SD	D	N	A	SA
Sometimes politics and government seem so complicated that a person like me can't really understand what's going on.	SD	D	N	A	SA
Learning new ways to think doesn't excite me very much.	SD	D	N	A	SA

I follow political and social issues because it bothers me when I don't.	SD	D	N	A	SA
Thinking is not my idea of fun.	SD	D	N	A	SA
The notion of thinking abstractly is appealing to me.	SD	D	N	A	SA

2. Do you feel like your attitudes about climate change were impacted by participating in this event?

☐ No, not at all
 ☐ No, not very much
 ☐ Yes, a little
 ☐ Yes, some
 ☐ Yes, quite a bit

If you are willing, please explain your answer to the previous question:

CLIMATE CHANGE AND ENERGY

Some of the questions below are about things you may have learned about as part of this process, and will help us understand if we need to improve our information delivery. Other questions relate to climate change, because climate change is a political controversy known to sometimes hinder community discussions about topics such as energy.

3. Please indicate whether you think the following are true or false.

	Definitely False	Probably False	Probably True	Definitely True	Don't Know
Cap-and-trade legislation would directly tax corporations for the amount of greenhouse gas emissions they produced.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal funding for the Cleaner Greener Lincoln program will expire in 2013.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The reEnergize program provides professional energy evaluations to qualified Lincoln residents, businesses, and non-profits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The sun gets brighter at a rate of about 1% per year.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. The oceans store _____ amount of heat and carbon dioxide as the atmosphere.

- ☐ Less than 5% of the
☐ About 50% of the
☐ About the same
☐ About 5 times the
☐ More than 50 times the
☐ *Don't know*

5. According to the National Oceanic and Atmospheric Administration, if greenhouse gases were stopped completely today, rainfall and sea level would...

- ☐ Be largely irreversible for 1,000 years
☐ Return to normal within about 100 years
☐ Result in catastrophic events
☐ Prevent otherwise certain catastrophic events
☐ *Don't know*

6. Which of the following is not currently a part of the Sustainable Lincoln Plan?

- ☐ Energy upgrade Incentives
☐ Expanding wind power
☐ Voluntary emissions reductions
☐ Upgrading traffic lights
☐ Assisting non-profits
☐ *Don't know*

7. Do you feel like your knowledge of how the “climate system” works increased as a result of participating in this event?

- ☐ No, not at all
☐ No, not very much
☐ Yes, a little
☐ Yes, some
☐ Yes, quite a bit

8. Personally, how well informed do you feel you are about how the Earth’s “climate system” works?

- ☐ Not at all informed
☐ Not very well informed
☐ Fairly well informed
☐ Very well informed

9. According to recent surveys, what is the approximate percentage of all climate scientists that think that the global climate is warming due to human actions? (If you do not know, please guess)

_____ % (0-100%)

10. People disagree about how the climate system works. Which one of the five descriptions best describes how you think the climate system works?

- ☐ Gradual: Earth’s climate is slow to change. If global warming occurs, it will gradually lead to dangerous effects.
☐ Fragile: Earth’s climate is delicately balanced. Small amounts of global warming will have abrupt and catastrophic effects.
☐ Stable: Earth’s climate is very stable. If global warming occurs, it will have little to no effects.
☐ Threshold: Earth’s climate is stable within limits. If global warming is small, climate will return to a stable balance. If it is large, there will be dangerous effects.
☐ Random: Earth’s climate is random and unpredictable. We do not know what will happen.

11. Global warming refers to the idea that the world’s average temperature has been increasing over

the past 150 years, may be increasing more in the future, and that the world's climate may change as a result. What do you think? Do you think that global warming is happening?

☐ Yes, definitely
 ☐ Yes, probably
 ☐ No, probably not
 ☐ No, definitely not
 ☐ Don't know

12. On some issues people feel that they have all the information they need in order to form a firm opinion, while on other issues they would like more information before making up their mind. For global warming, where would you place yourself?

☐ I need **a lot** more information
 ☐ I need **some** more information
 ☐ I need **a little** more information
 ☐ I **do not need any** more information

13. Please indicate whether you think the following are True or False.

	Definitely False	Probably False	Probably True	Definitely True	Don't Know
Increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to global climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Human activity, including industry and transportation, is a significant cause of climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
If global warming occurs, it will increase crop yields in some places, and decrease it in others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Currently observed climate change is mostly due to normal climate patterns.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
The Earth's climate is warmer now than it has ever been before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Compared to the climate of the past one million years, the last 10,000 have been unusually warm and stable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
If humankind suddenly stopped producing carbon dioxide today, climate change and global warming would still continue for many years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Over time, any climate change that happens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

	Definitely False	Probably False	Probably True	Definitely True	Don't Know
will be more beneficial than harmful.					
Actions taken to “stop global warming” are hurting society more than helping.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

14. Public opinion polling has shown that when it comes to climate change, the population is roughly divided into the following 6 different categories. Right now, which descriptor best describes how you feel about climate change?

- ☐ Alarmed
- ☐ Concerned
- ☐ Cautious
- ☐ Disengaged
- ☐ Doubtful
- ☐ Dismissive

15. In your opinion, what is the risk of climate change exerting a significant impact on...

	No risk at all	A slight risk	A moder- ate risk	A high risk	A very high risk
... <i>public health</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... <i>economic development</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... <i>nature</i> , that is, the natural <i>environment</i> in your region?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

BACKGROUND DOCUMENT

We are always striving to improve our materials and would very much appreciate having your feedback.

16. What was your experience reading the FIRST background document?

While reading the background document, I ...	Not at all	Slightly	Somewhat	Moderately	Very much
Felt inspired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt like my mind was already made up.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed my ideas about the topics with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt open to hearing new ideas about the topics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wished I were doing something else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

While reading the background document, I ...	Not at all	Slightly	Somewhat	Moderately	Very much
Felt angry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thought of novel or inventive issues related to the topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to find answers to my questions about the topics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was thorough in my consideration of the issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talked to others about the topics to get their opinions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt creative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checked myself to see how well I understood the issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt bored.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to understand perspectives different from mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Became irritated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt like new information would not change my opinions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thought about how the topics related to things I know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt focused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was uninterested in the task I was asked to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked others what they thought about the topics and issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt open-minded.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identified questions that I still had about the topics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gave careful consideration to all of the options presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt frustrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Do you have any other feelings or experiences you would like to report about the background materials or today's focus group? If so, do so here:

DEMOGRAPHIC QUESTIONS

The questions listed below will help inform our research. Your responses will be confidential and anonymous.

18. What is your gender?

- ☐ Male
- ☐ Female

19. What is the highest level of education you completed?

- ☐ Some high school, but did not finish
- ☐ Completed high school
- ☐ Some college, but did not finish
- ☐ Two-year college degree / A.A / A.S.
- ☐ Four-year college degree / B.A. / B.S.
- ☐ Some graduate work
- ☐ Completed Masters or professional degree
- ☐ Advanced Graduate work or Ph.D.

20. How would you describe your current employment status?

- ☐ Employed full time
- ☐ Employed part time
- ☐ Unemployed / Looking for work
- ☐ Student
- ☐ Homemaker
- ☐ Retired

21. If you selected employed full time or part-time, which of the following best describes your occupation?

- ☐ K-12 educator
- ☐ Military
- ☐ Entrepreneur / Business Owner
- ☐ Higher Education Staff / Professional
- ☐ Higher Education Faculty
- ☐ Corporate employee
- ☐ Government employee
- ☐ City or Town official (volunteer or paid)
- ☐ Other: _____

22. Generally speaking, do you consider yourself to be a(n):

- ☐ Strong Democrat
- ☐ Not so strong Democrat
- ☐ Independent leaning Democrat
- ☐ Independent
- ☐ Independent leaning Republican
- ☐ Not so strong Republican
- ☐ Strong Republican
- ☐ Other
- ☐ Don't know

Thank you for your valuable input and time to this study!

FOCUS GROUP QUESTIONS

1. Consider your deliberation. How effective do you think the reading materials were to your discussion? Please describe.
2. How, if at all, did you discuss the materials provided in your group? Can you give an example?
3. Which did you refer to more in the deliberation: your own thoughts or the reading materials? Why? Can you provide an example?
4. What did you think about while reading the materials?
5. Tell me what you thought about the reading materials? What did you like or not like about them?
6. How would this type of information sharing be helpful in another deliberation?

I have a second set of reading material that is similar to your first reading, but presented in a different format. Please read this document, and then I will ask a few questions about your reaction to this document.

7. Consider your previous group deliberation. Do you think this reading would have been more effective in your discussion? Why or why not?
8. How would you have used these materials in your group deliberation?
9. What did you think about while reading this document? Was your impression different than the previous document?
10. What did you like or not like about this document?
11. How would this type of document be useful in another deliberation?

APPENDIX 3. ENGAGEMENT SCALE RESULTS

Figure A.1. Engagement Scale by Condition

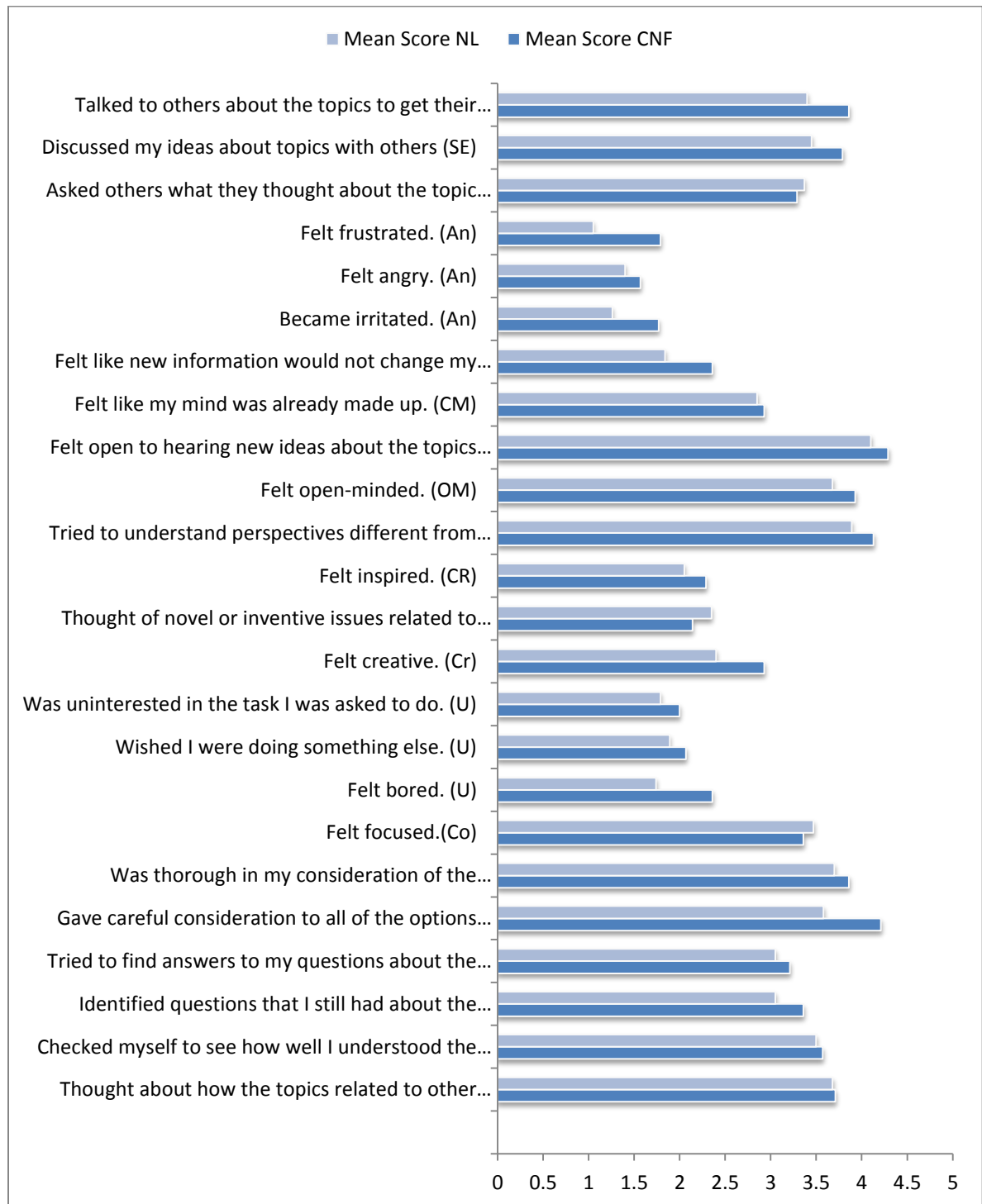


Table A.1. Engagement Scale and Mean Score by Condition

Engagement Scale	Mean Score All	Mean Score CNF	Mean Score NL
<u>Active Learning</u>			
Thought about how the topics related to other things I know.	3.70	3.71	3.68
Checked myself to see how well I understood the issues related to the topics I was learning about.	3.53	3.57	3.5
Identified questions that I still had about the topics.	3.18	3.36	3.05
Tried to find answers to my questions about the topics.	3.12	3.21	3.05
<u>Conscientious</u>			
Gave careful consideration to all of the options presented.	3.85	4.21	3.58
Was thorough in my consideration of the issues.	3.76	3.86	3.70
Felt focused.	3.42	3.36	3.47
<u>Uninterested</u>			
Felt bored.	2	2.36	1.74
Wished I were doing something else.	1.97	2.07	1.89
Was uninterested in the task I was asked to do.	1.88	2.00	1.79
<u>Creative</u>			
Felt creative.	2.12	2.93	2.40
Thought of novel or inventive issues related to the topic.	2.26	2.14	2.35
Felt inspired.	2.15	2.29	2.05
<u>Open-Minded</u>			
Tried to understand perspectives different from mine.	4.00	4.13	3.89
Felt open-minded.	3.79	3.93	3.68
Felt open to hearing new ideas about the topics	4.18	4.29	4.1
<u>Closed-Minded</u>			
Felt like my mind was already made up.	2.88	2.93	2.85
Felt like new information would not change my opinions	2.06	2.36	1.84
<u>Angry</u>			
Became irritated.	1.47	1.77	1.26
Felt angry.	1.47	1.57	1.4
Felt frustrated.	1.36	1.79	1.05
<u>Social</u>			
Asked others what they thought about the topic and issues (SE)	3.33	3.29	3.37
Discussed my ideas about topics with others (SE)	3.59	3.79	3.45
Talked to others about the topics to get their opinions (SE)	3.59	3.86	3.40

Table A.2. Mean Difference and Effect Size in Engagement Scale

	MEAN DIFFERENCE	EFFECT SIZE (<i>d</i>)
Thought of novel or inventive issues related to the topic.	-0.21	-0.18
Felt focused.	-0.12	-0.11
Asked others what they thought about the topic and issues.	-0.08	-0.07
Thought about how the topics related to other things I know.	0.03	0.03
Felt like my mind was already made up.	0.08	0.07
Checked myself to see how well I understood the issues related to the topics I was learning about.	0.07	0.08
Wished I were doing something else.	0.18	0.16
Tried to find answers to my questions about the topics.	0.16	0.16
Felt Angry.	0.17	0.17
Was uninterested in the task I was asked to do.	0.21	0.19
*Felt inspired.	0.24	0.22
+Was thorough in my consideration of the issues.	0.16	0.23
*Felt open to hearing new ideas about topics.	0.19	0.24
Discussed my ideas about topics with others.	0.30	0.25
*Felt open-minded.	0.24	0.27
Tried to understand perspectives different from mine.	0.25	0.29
*Discussed my ideas about topics with others	0.34	0.31
*Talked to others about the topics to get their opinions	0.46	0.39
*Felt creative.	0.53	0.44
Felt like new information would not change my opinions.	0.52	0.47
~Became irritated	0.51	0.50
~Felt bored.	0.62	0.59
+Gave careful consideration to all of the options presented.	0.64	0.94
~Felt frustrated.	0.73	1.03

+ indicates negative effect; - indicates positive effect where .20 is a small effect and .80 is a large effect (Thalheimer & Cook, 2002).

APPENDIX 4. BIBLIOGRAPHY

- Asen, R., & Brouwer, D. C. (Eds.). (2001). *Counterpublics and the State*. Albany, NY: SUNY Press.
- Barnes, M., Newman, J., Knops, A., & Sullivan, H. (2003). Constituting 'the public' in public participation. *Public administration*, 81(2), 379-399.
- Baxter, L. A., & Braithwaite, D.O. (2008). *Engaging theories in family communication: Multiple perspectives*. Thousand Oaks, CA: Sage Publications.
- Bechara, A., Damasio, H., & Damasio, A. R. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral cortex*, 10(3), 295-307.
- Bell, K.P., Lindenfeld, L.A., Speers, A.E., Teisl, M.F., & Leahy, J.E. (2013). Creating opportunities for improving lake-focused stakeholder engagement: Knowledge-action systems, pro-environmental behavior and sustainable lake management. *Lakes & Reservoirs: Research & Management*, 18, 5-14.
- Bohman, J. (1996). *Public deliberation: Pluralism, complexity, and democracy*. Cambridge, MA: The MIT Press.
- Bohman, J. (2004). Expanding dialogue: The Internet, the public sphere and prospects for transnational democracy. *The Sociological Review*, 52(s1), 131-155.
- Brockman, J. (Ed.). (1996). *Third Culture: Beyond the Scientific Revolution*. New York: Simon & Schuster.
- Castells, M. (2008). The new public sphere: Global civil society, communication networks, and global governance. *The ANNALS of the American Academy of Political and Social Science*, 616(1), 78-93.
- Castells, M. (2011). *The rise of the network society: The information age: Economy, society, and culture* (Vol. 1) (2nd Ed.). Oxford: Blackwell.
- Cheney, G. (2000). Interpreting interpretive research: Toward perspectivism without relativism. In S. R. Corman & M. S. Poole (Eds.), *Perspectives on organizational communication* (pp. 17-45). New York: The Guilford Press.
- Couldry, N., Livingston, S., & Markham, T. (2007). *Media consumption and public engagement: Beyond the presumption of attention*. New York, NY: Palgrave Macmillan.
- Cox, R. (2013). *Environmental Communication and the public sphere*. Thousand Oaks, CA: Sage.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.

- Dahlgren, P. (2005). The Internet, public spheres, and political communication: Dispersion and deliberation. *Political Communication*, 22(2), 147-162.
- Deetz, S. (2011). *A basic introduction to interaction design, collaborative processes and generative democracy*. (Unpublished manuscript).
- Deetz, S. (2001). Conceptual foundations. In F. M. Jablin & L. L. Putnam (Eds.), *The new handbook of organizational communication* (pp. 3-46). Thousand Oaks: Sage.
- Delli Carpini, M. X., Cook, F. L., & Jacobs, L. R. (2004). Public deliberation, discursive participation, and citizen engagement: A review of the empirical literature. *Annual Review of Political Science*, 7, 315-344.
- Dietrich, H.L. (2013). *The role of emotion in environmental decision making*. (Unpublished dissertation). University of Nebraska-Lincoln, Lincoln, NE.
- Fahrenstock, J. (1986). Accommodating science: The rhetorical life of scientific facts. *Written Communication*, 3(3), 275-296.
- Fisher, W.R. (1984). Narration as a human communication paradigm: The case of public moral argument. *Communication Monographs*, 51, 1-21.
- Fisher, W. R. (1989). Clarifying the narrative paradigm. *Communications Monographs*, 56(1), 55-58.
- Fishkin, J. (1991). *Democracy and deliberation*. New Haven, CT: Yale University Press.
- Gastil, J., Deess, E. P., & Weiser, P. (2002). Civic awakening in the jury room: A test of the connection between jury deliberation and political participation. *Journal of Politics*, 64(2), 585-595.
- Gastil, J., & Dillard, J. P. (1999). Increasing political sophistication through public deliberation. *Political Communication*, 16(1), 3-23.
- Govier, T., & Ayers, L. (2012). Logic and parables: Do these narratives provide arguments? *Informal Logic*, 32(2), 161-189.
- Gutkind, L. (2005). What is creative nonfiction. *Creative Nonfiction* (online edition). Retrieved from: <https://www.creativenonfiction.org/what-is-creative-nonfiction>.
- Gutkind, L. (2011). (Video file). Lee Gutkind talks about creative nonfiction writing for scientists. YouTube: ATT Tech Channel. Retrieved from: <http://www.youtube.com/watch?v=SiAGXqpaTuw>.
- Habermas, J. (1984). *The theory of communicative action, Vol. I*. Boston, MA: Beacon.
- Habermas, J. (1991). *The structural transformation of the public sphere: An inquiry into a category of bourgeois society*. Boston, MA: MIT press.

- Habermas, J., Lennox, S., & Lennox, F. (1974). The public sphere: An encyclopedia article (1964). *New German Critique*, (3), 49-55.
- Hartelius, E.J. (2008). *The rhetoric of expertise*. (Doctoral dissertation). University of Texas at Austin, Austin, TX.
- Hauser, G. A. (2007). Vernacular discourse and the epistemic dimension of public opinion. *Communication Theory*, 17(4), 333-339.
- Hauser, G.A. (1987). Features of the public sphere. *Critical Studies in Mass Communication*, 4 (4), p. 437.
- Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education & Behavior*, 34(5), 777-792.
- Jones, M.D. (2013). Cultural characters and climate change: How heroes shape our perception of climate science. *Social Science Quarterly*.
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, 2(10), 732-735.
- Kurpius, D. D., & Mendelson, A. (2002). A case study of deliberative democracy on television: Civic dialogue on C-SPAN call-in shows. *Journalism & Mass Communication Quarterly*, 79(3), 587-601.
- Lanham, R. A. (2006). *The economics of attention: Style and substance in the age of information*. Chicago, IL: University of Chicago Press.
- Lindenfeld, L.A., Hall, D.M., McGreavy, B., Silka, L., & Hart, D. (2012). Creating a place for environmental communication research in sustainability science. *Environmental Communication: A Journal of Nature and Culture*, 6(1), 23-43.
- Lippmann, W. (1927). *The phantom public*. Transaction Publishers.
- Lyne, J. (2010). Rhetoric and the third culture. In M.J. Porrovecchio (Ed.) *Reengaging the prospects of rhetoric: Current conversations and contemporary challenges*. New York: Routledge.
- Lupia, A. (2009). Can online deliberation improve politics? Scientific foundations for success. In T. Davies & S.P. Gangadharan (Eds) *Online deliberation: Design, research, and practice*. CSLI Publications, 59-66.
- Majone, G. (1989). *Evidence, argument, and persuasion in the policy process*. New Haven, CT: Yale University Press.

- Marcus, G.E. (2002). *The sentimental citizen: Emotion in democratic politics*. University Park, PA: The Pennsylvania State University Press.
- Mazer, J. P. (2013). Validity of the student interest and engagement scales: Associations with student learning outcomes. *Communication Studies*, 64(2), 125-140.
- Mitchell, G.R. (2010). Switch-side debating meets demand-driven rhetoric of science. *Rhetoric & Public Affairs*, 13(1), 95-120.
- Morgan, D.L., & Krueger, R.A. (1993). When to use focus groups and why. In Morgan, D. (Ed.) (1993). *Successful focus groups: Advancing the state of the art*. Newbury Park, CA: Sage.
- Mumby, D. K., & Stohl, C. (1996). Disciplining organizational communication studies. *Management Communication Quarterly*, 10, 50-72.
- Nisbet, M.C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development*, 51(2), 12-23.
- Noelle-Neumann, E. (1974). The spiral of silence a theory of public opinion. *Journal of communication*, 24(2), 43-51.
- Nussbaum, M.C. (1995). *Poetic Justice: The literary imagination and public life*. Boston: Beacon Press.
- Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks CA: Sage.
- Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action: Presidential address, American Political Science Association, 1997. *American Political Science Review*, 92(1), 1-22.
- Oswick, C., Anthony, P., Grant, D., Keenoy, T., & Mangham, I. L. (1999). Collective Cognition or Social Construction? A Dialogic Analysis of Organisational Learning. In *3rd International Conference on Organisational Learning, Lancaster University, UK*.
- Oswick, C., Anthony, P., Keenoy, T., Mangham, I. L., & Grant, D. (2000). A dialogic analysis of organizational learning. *Journal of Management Studies*, 37(6), 887-902.
- Owen, W.F. (1984). Interpretive themes in relational communication. *Quarterly Journal of Speech*, 70, 274-287.
- Perez, O. (2008). Complexity, information overload, and online deliberation. *ISJLP*, 5, 43.
- Pfister, D.S. (2013). Shallow quotation and translation on RealClimate. (Unpublished manuscript).

- Pfister, D.S. (2009) *Toward a Grammar of the Blogosphere: Rhetoric and Attention in the Networked Imaginary*. (Doctoral Dissertation). University of Pittsburgh, Pittsburgh, PA.
- Pfister, D. S. (2011). Networked expertise in the era of many-to-many communication: On Wikipedia and invention. *Social Epistemology*, 25(3), 217-231.
- Poole, M. S. (2011). Communication. In S. Zedeck (Ed.) *APA handbook of industrial and organizational psychology* (Vol. 3, pp. 249-270). Washington, DC: APA.
- Pugh, K. J., Linnenbrink-Garcia, L., Koskey, K. L., Stewart, V. C., & Manzey, C. (2010). Teaching for transformative experiences and conceptual change: A case study and evaluation of a high school biology teacher's experience. *Cognition and Instruction*, 28(3), 273-316.
- PytlikZillig, L.M., & Tomkins, A.J. (2011). Public engagement for informing science and technology policy: What do we know, what do we need to know, and how will we get there? *Review of Policy Research*, 28(2), 198-217.
- PytlikZillig, L.M., Tomkins, A.J., Anderson, R., & Walther, J. (2012). Using creative nonfiction as a means of presenting scientific information. (Unpublished research project; IRB: 20121212985 EP). University of Nebraska.
- PytlikZillig, L.M., Wang, S., Harris, R., Muhlberger, P., Hutchens, M.J., Neiman, J.L., & Tomkins, A.J. (2013). *The varieties of participant engagement (VoPE) scales: A confirmatory factor analysis across two samples and contexts*. Manuscript submitted for publication.
- PytlikZillig, L.M., Anderson, R., Phear, N., & Walther, J. (2013b). *Using creative non-fiction to communicate about climate change*. Poster presented at the Water for Food Conference, Lincoln, NE.
- Raffensperger, C. (1998). Guess Who's Coming for Dinner: The Scientist and the Public Making Good Environmental Decisions. *Human Ecology Review*, 5, 37-41.
- Rowe, G., & Frewer, L. J. (2000). Public participation methods: A framework for evaluation. *Science, technology & human values*, 25(1), 3-29.
- Scott, R.L. (1993). Dialectical tensions of speaking and silence. *Quarterly Journal of Speech*, 79, 1-18.
- Schulz-Hardt, S., Frey, D., Lüthgens, C., & Moscovici, S. (2000). Biased information search in group decision-making. *Journal of Personality and Social Psychology*, 78(4), 655.
- Sigman, S.J. (1987). *A perspective on social communication*. Lexington, MA: Lexington Books.

- Steimel, S. (2011). *Negotiating tensions across organizational boundaries: Communication and refugee resettlement organizations*. (Doctoral dissertation). University of Nebraska-Lincoln, Lincoln, NE.
- Sunstein, C. (2001). The daily me. In *Republic.com* (p. 3-22). Princeton, NJ: Princeton University Press. Retrieved from: <http://press.princeton.edu/chapters/s7014.pdf>.
- Sunstein, C. (2005). Group judgments: Statistical means, deliberation, and information markets. *New York University Law Review*, 80, 962–1049.
- Sunstein, C. (2006). *Infotopia: How many minds produce knowledge*. New York, NY: Oxford University Press.
- Taylor, T. (2002). Modern social imaginaries. *Public Culture*, 14(1), 91-124.
- Thalheimer, W., & Cook, S. (2002, August). *How to calculate effect sizes from published research articles: A simplified methodology*. Retrieved November 31, 2002 from http://work-learning.com/effect_sizes.htm.
- Torgerson, D. (1999). *The promise of green politics: environmentalism and the public sphere*. Durham, NC: Duke University Press.
- Van Gelder, T. (2003). Enhancing deliberation through computer supported argument visualization. In *Visualizing argumentation* (pp. 97-115). Springer London.
- Weaver, R.M. (1985). *The Ethics of Rhetoric*. Routledge.
- Webler, T. (1998). Beyond science: Deliberation and analysis in public decision making. *Human Ecology Review*, 5, 61-62.
- Weeks, E. C. (2000). The Practice of Deliberative Democracy: Results from Four Large-Scale Trials. *Public Administration Review*, 60(4), 360-372.