Talk About Climate change: park ranger interpreters on the hot seat.

by

Robyn Cloughley

A Thesis
Submitted in partial fulfillment
Of the requirements for the degree
Master of Environmental Studies
The Evergreen State College
June 2021

© 2021 by Robyn Cloughley. All rights reserved.

This Thesis for the Master of Environmental Studies Degree

by

Robyn Cloughley

has been approved for

The Evergreen State College

by

Kathleen M. Saul, Ph.D.

Member of Faculty

Date

ABSTRACT

We Talk About Climate change: Park Ranger Interpreters on the Hot Seat

Robyn Cloughley

One of the most important things we can do about anthropogenic climate change is to talk about it, making it easier to act on it. Many public lands showcase physical, compelling evidence of climate change, past and present. Park ranger interpreters are directed to talk about it in National Parks. Resources abound to coach park ranger interpretive staff in the fine art of handling potentially controversial subjects including anthropogenic climate change. Yet interpretive staff remark that climate change conversations at public lands visitor centers are uncommon. This thesis explores the possible impact from staff group dynamics on individual staff members willingness to talk about anthropogenic climate change with public lands visitors. The results of this study indicate that the group dynamic most impacting park ranger interpretive staffs' willingness to talk about climate change is the interpersonal dynamic between the park ranger interpreter and the public lands' visitor or visitors. Providing scientific or academic based education to the public can conflict with positive customer service if the information is controversial.

Table of Contents

Acknowledgements v
Literature Review 1
  Social Psychology 3
  Group Life 4
    Group structure 5
  General Avoidance of Climate Change Conversations 7
Methods 11
Results/Discussion 13
  Climate Change Conversations 14
  Group Dynamics 19
    Group Cohesion 19
    Group Member Interdependence 20
  Group Dynamics Meets Climate Change Conversation Avoidance 22
Customer Service or Educating the Public? 22
Positionality Statement 28
Conclusion 29
References 32
Appendix A 40

Acknowledgements

Thank you to the interviewees. I am most grateful for their time and willingness to share their thoughts. I feel very honored to have been entrusted with their perspectives on their work and how it intersects with anthropogenic climate change conversations. I have a heartfelt appreciation for the unique intelligence and passion of everyone working for public lands.

Thank you all the MES faculty and staff for your hard work and dedication, especially during the difficulties imposed by the COVID-19 pandemic.

Thank you, Kathleen Saul, for the exceedingly long time I have felt that you were always in my corner.

Thank you, Brandt Detering, for taking on tasks that allowed me to continue writing my thesis and for keeping us laughing.

Thank you, Scott Dubble, for making this endeavor possible.

Literature Review

In public lands parks across the country, park ranger interpretive staff face engaging the public on the topic of anthropogenic climate change. Park ranger interpreters are the staff members who talk to people. They answer questions, conduct tours and hikes, and present programs. The National Park Service partnered with Colorado State College to survey both visitors and interpretive staff at the parks discovering that while visitors said they wanted park staff to educate them on anthropogenic (human-caused) climate change, park staff responded with reluctance to engage visitors (NPS Climate Change Response, 2013; *NPS Training - Climate Change Response Program (U.S. National Park Service)*, 2015). Park ranger interpretive staff stated overall that visitors are not interested in discussing climate change, that the staff do not want to "burden" visitors with the issue, and that the interpreters themselves felt unsure about their climate science literacy.

Researchers in Missouri State Parks and Historical Sites (Balasubramanyam et al., 2019) asked employees specifically about their own perceptions of climate change, the evidence of it at their sites, and how those elements intersect to impact engaging visitors on the topic. Results of their interviews and surveys indicated that employees in Missouri State Parks have lots of uncertainty about the science of climate change and attributing current climate change to human behavior. Interpretive staff also mentioned lack of physical impacts at their specific sites and seeing their roles as more of park stewards versus climate change experts.

As in the National Park surveys, Missouri state employees also mentioned not wanting to intrude on visitors' holiday recreation by bringing up the negative impacts of climate change. Likewise, during discussions of interpreting climate change at the annual National Association for Interpreters Conference 2020 in November, many professional and amateur public lands interpreters cited insecurity about their knowledge of the complex science of climate change as reasons to avoid engaging the public on this issue (NAI National Virtual Conference 2020, November 10 - 13). Even as participants cited the many resources for understanding the basics of anthropogenic climate change, and the tutorials on how to talk to others about the potentially emotional issue, and with the conference itself providing more resources and training, interpretive staff still felt reluctant to discuss the science and unprepared to deal with visitors' reactions. What else besides individual level of scientific knowledge and training to de-escalate confrontational situations could be discouraging park ranger interpretive staff from communicating about climate change?

My own experience working at public lands visitor centers suggested the pressures, "real, imagined, or implied" as social psychology defines, from coworkers, supervisors, and visitors could affect whether interpretive staff engage in climate change conversations. At one visitor center, I was concerned about failing to correct a visitor on his climate change views, whereas at a different visitor center, my coworker accused me of bringing politics into our federal facility when I answered a direct question about anthropogenic climate change. Therefore, my research question is: How might staff group dynamics impact individual park ranger interpreters' willingness to engage in climate change conversations at public lands visitor centers?

Much research explains our human aversion to and difficulty with the idea that we could be making our climate unfit for ourselves just by going about our daily lives, so it is not surprising that people in the profession of park ranger interpreters find conversations on the subject daunting (Dunlap & Brulle, 2015; Fielding et al., 2014; Hulme, 2009; Kahan, 2012; Leiserowitz, 2006; Marshall, 2014). One can approach the resistance to talking about climate change through academic disciplines of sociology, psychology, social psychology, political science, and economics, for example. Various theories have emerged within each of these disciplines to explain how individuals discern risk (Leiserowitz, 2006; Linden, 2014), how cultures and subcultures assign value to aspects of life (Hulme, 2009), and how regional views on governance and religion (Brownlee et al., 2013) can impact our willingness to talk about climate change.

My research probes how group dynamics might impact the behavior of individuals in the group. This study falls under the field of social psychology and the powerful influence of groups on group members.

Social Psychology

Social psychology is "…the scientific study of the ways in which people's thoughts, feelings, and behaviors are influenced by the real, imagined, or implied presence of other people" (Aronson & Aronson, 2018, p. 32). Humans, according to social psychology, are *the* social animal (Aronson & Aronson, 2018;) or the "ultra-social animal" (Tomasello, 2014, p. 7). Michael Tomasello, professor in the Department of Psychology and Neuroscience at Duke University and past co-director of the Max Planck Institute for Evolutionary Anthropology, said that humans are ultra-cooperative. Testing on human children as young as 18-months-old demonstrated a collaborative trajectory that our closest relatives, the chimpanzees and bonobos of any age, are unable to match (Tomasello, 2010). The importance of our socialness left behind evidence in our children's cognitive development and our complex language, which gives us our species-unique ability to share knowledge, experiences, and perspective in a way no other animal can (Dunbar, 1996; Moll & Tomasello, 2007; Tomasello & Carpenter, 2007).

Current neuroscience also illuminates our social natures. We are so obsessed with others, and our place amongst others, that our brain's "default network", the system in our brain that lights up in fMRI imaging when we have not been given any task, is the same system our brain uses to consciously think about social situations (Lieberman, 2013). In other words, our brain's base system is the system for thinking about ourselves in relation to other people.

When we think about ourselves in relation to others, we are mostly thinking of people and situations with whom we are familiar – our social life. "Our responsiveness to social situations – and therefore their considerable impact – results from evolutionary pressures for individuals to survive in groups…other people constitute our evolutionary niche" (Fiske, 2018, p. 11). A long list of human universals that "all humans manifest regardless of their culture…points to the centrality of group life for the survival or our species" (Aronson & Aronson, 2018, pp. 50–51). This kind of power should not be underestimated.

Group Life

The need to belong is the core social motive for humans and the base of social situations (Baumeister & Leary, 1995; Fiske, 2018). Social psychology takes a scientific view that an individual's behavior is to a large extent a response to their social situation rather than a function of their personality (Fiske, 2018, p. 6; Shaw, 1981, p. 262). Could the need to belong to a group exert pressure on whether an interpretive staff member chooses to engage in anthropogenic climate change conversations?

People prefer groups that include two to six members when actual interaction is required for the purpose of the group (Fiske, 2018; Mullen, 1991; Forsyth, 2018). Thus, most naturally occurring face-to-face groups consist of a small number of members. My experience has been mostly at small public lands visitor centers with small staff groups. For interviews with people in larger staff groups, I asked respondents answer group dynamic questions based on the small number of staff with which they interacted daily.

Group structure

A group can be defined in simple terms as “interacting people considered by themselves or others to belong together” (Fiske, 2018, p. 390). To dig deeper into that definition, an aggregate of people becomes a “group” when the members are perceived by themselves and/or others as a *functioning single unit* based on their similarity, common fate (interdependence), and maybe the proximity of the members. Susan Fiske provided the example of people riding in an elevator. The people are merely an aggregate; people in close proximity only because they happen to be in the same place at the same time riding in an elevator car. However, if the elevator were to get stuck between floors, then the people in the elevator car might become a “group” – working together, reliant on each other’s skills and abilities, to solve their problem and escape the stuck elevator car. If the people were similar in “age, gender, ethnicity, or class” (Fiske, 2018, p. 390) they might become an even tighter group.

When people first come together to interact, individual differences appear. Some talk more, some leap to task, some exert more influence, some sit back and observe. “Differentiations occur among the members of the group such that inequalities exist among them along a variety of dimensions. These differentiations are the basis for the formation of group structure” (Shaw, 1981, pp. 262–263). The connections between each facet of one member and another creates a web of connections, an overarching structure composed of several single structures. For instance, coworkers who like physical work and have experience operating large machinery might form a single structure within and supporting the larger group structure. For interaction with the public like hosting a booth at special events, outgoing staff members who are funny and not shy about talking to strangers might be the core of that structure which can then incorporate other staff spreading experience and instruction while strengthening the overall group structure. Staff members who are interested and experienced in writing and editing educational materials lead an outdoor interpretive signage team creating another substructure. In this way, various unique links between different group members differentiated by task, personality, and/or experiential inequalities create single structures that nest within "…an integrated organizational pattern that reflects the totality of the separate parts that inhere in each individual group member. An adequate conception of group structure must recognize this complexity" (Shaw, 1981, p. 263).

Interdependence, working together towards a common goal with some degree of cooperation, is key in defining groups for many researchers (Poole & Hollingshead, 2004; Shaw, 1981; Forsyth, 2018; Thibaut, 1959). Having a common goal creates interdependence because people need each other to accomplish the goal (Fiske, 2018, p. 390). For example, in 2018 seasonal employees came together at a visitor center. We did not know each other previously. We came from different states, religious backgrounds, ethnicities, and were of different genders and ages. Our first task was to design a parade float that could be built on our truck. Having the common goals of managing resources, creating and implementing the design, and winning the subsequent competition, made us dependent upon each other's skills, ideas, and our ability to cooperate and compromise to attain our goals. We became a "group". We won an award as a group, even if we defined single roles for each of us based on our talents, enthusiasms, and experience. We individually took roles of the creative inspirer, the engineer, the director of energy, the social facilitator, etc. This structure existed for one precise goal – to create a parade float. As our group functioned over the next six months, our proximity (working in the same place), our similarity (all employees of this visitor center), our interdependence, and our ongoing interaction, encouraged group cohesion and a sense of group membership. We perceived ourselves, and others perceived us, as a *functioning single unit* – in short, a staff group.

Group cohesion is perhaps the most theoretically important concept of group dynamics (Forsyth, 2018). It is a large subtopic applicable to my study due to supervisor encouragement for cohesion within staff groups. According to Susan Fiske, the factors of proximity, similarity, interdependence and ongoing interaction lead towards group cohesion, and group cohesion result in "a shared understanding of their situation and an emotional bond with each other" (Fiske, 2018, p. 390). Groups can develop social, task, identity, emotional, and structural cohesion to name just five overlapping and important types (Forsyth, 2018, p. 128). In my study, supervisors spoke of setting clear goals with tasks that require the collective effort of the group for engendering emotional and identity cohesion, for example.

Cohesion can be beneficial in that tighter cohesion can indicate increased productivity and long-term sustainability. It also can be detrimental to independent, diverse thinking by inhibiting disagreement (Aronson & Aronson, 2018; Edmondson, 1999; Forsyth, 2018).

General Avoidance of Climate Change Conversations

Before addressing the impediments particular to park ranger interpretive staff talking about anthropogenic climate change, I will briefly discuss two social psychological perspectives that bring a comprehensive approach to why people generally, and specifically in the United States ("Climate Change in the American Mind," 2020), avoid talking about climate change. Overarching theories and explanations for Western societies' lack of urgent response to climate change include Terror Management Theory and the avoidance of cultural trauma. My descriptions will merely touch on the ideas presented in these complex concepts.

Ernest Becker’s work in the early 1970’s led to the formalization of Terror Management Theory in social psychology (Dickinson, 2009). Terror Management Theory is supported by over 400 empirical studies (Dickinson, 2009; Pyszczynski et al., 2006, 2010). These studies and the theory uniting them reinforce Becker’s idea that humans, as creatures aware of their mortality and able to imagine their own death, would be predisposed to evolve psychological barriers to avoid this terrifying mental state. Death thoughts would be so costly to our species, that all humans would eventually create socially and cultural realities that provide a way for us to enhance our self-esteem and give us a sense of immortality. Human mythologies of an afterlife and world views that focus on leaving legacies are the result (Becker, 2007; Dickinson, 2009).

Janis Dickinson used Terror Management Theory to explain general human reluctance to urgently address anthropogenic climate change. She cited empirical studies utilizing reminders of death to explore both conscious and unconscious psychological coping mechanisms that work to push ideas of death from our minds (Dickinson, 2009; Pyszczynski et al., 1999, 2006). In relation to climate change, conscious defenses against thinking about mortality are likely to be displayed as outright denial or skepticism, doubts as to human-causes of changes, and projections of impacts far into the future rather than during the individual’s lifetime. Unconscious defenses are symbolic and work like a seesaw between self-esteem and death thoughts. Empirical studies of Terror Management Theory predictions include verbal, written, and subliminal death stimuli and result in an increased effort to bolster self-esteem (Harmon-Jones et al., 1997; Pyszczynski et al., 2010; Routledge et al., 2010) . Self-esteem immortality projects that help us move past our time-limited lives used to be more focused on nature-based rebirth and renewal, but the more universal self-esteem, immortality projects today are money-centered. Increased striving for self-esteem, especially in Western society, can increase status-driven consumption and materialism that increase carbon emissions (Dickinson, 2009). George Marshall places the narrative around climate change within Terror Management Theory by writing, “the most pervasive narrative of all is the one that is not voiced: the collective social norm of silence…is all too similar to that other great taboo, death…”(Marshall, 2014, p. 3).

The notion of cultural trauma avoidance is used by Robert J Brulle and Kari Marie Norgaard to explain the “…*social inertia*, the interrelated cultural, institutional, and individual processes that inhibit action…” on the dire issue of climate change (Brulle & Norgaard, 2019). Globally, Western societies have done little to reduce their carbon emissions, the cause of anthropogenic climate change. In fact, even with the decrease in emissions due to the global COVID-19 pandemic, carbon emissions are expected to not only rebound, but to increase in 2021 (*Global Energy Review 2021 – Analysis*, n.d.; *Home | Climate Action Tracker*, n.d.). Robert Brulle and Kari Marie Norgaard’s work sought to connect the disparate social science perspectives on the lack of realistic Western societal response to anthropogenic climate change through the lens of cultural trauma avoidance model. Brulle and Norgaard defined cultural trauma as “ a social process that involves the systematic disruption of the cultural basis of a social order” (Brulle & Norgaard, 2019, p. 3). Alexander, et. al., (2004), emphasized that cultural trauma is felt by a collectivity when an event occurs that forever alters their group consciousness and identity and can be initiated “by an abrupt and unexpected, and sometimes not even particularly malevolent, experience of social transformation and change” (Alexander et al., 2004, p. 2). Addressing anthropogenic climate change requires profound societal change of Western nations (Brulle & Norgaard, 2019; Leahy et al., 2010). Brulle and Norgaard argued that the general and inclusive model of cultural trauma avoidance explains “the powerful processes that work at individual, institutional, and overall society levels to maintain current orientations and ensue social and cultural stability" thus creating social inertia (Brulle & Norgaard, 2019, p. 9).

For instance, even though there is ample evidence of dire consequences to humanity and civilization of continuing to emit the carbon dioxide into the atmosphere at the levels that current daily living in Western nations entails, many citizens of these nations continue to consume at socially expected levels by building large houses, buying large cars, frequently traveling by airplane, and expecting to have levels of energy production and lifestyle remain where they are today. Corporations often fail to put ecological health above making profits and governments must compromise to win constituent support (Brulle & Norgaard, 2019; Garrett et al., 2020; Weyler, 2021).

Forces explained by cultural trauma avoidance and Terror Management Theory affect people across political boundaries and cultures. These two broad perspectives highlight the overall reasons people tend to avoid anthropogenic climate change conversations providing a backdrop for likely difficulties of engaging in these conversations at visitor centers. Visitors might answer surveys indicating that they want climate change education at public lands sites (Balasubramanyam et al., 2019; NPS Climate Change Response, 2013), but what they seek is something in the abstract versus the actuality of conducting conversations on this topic and particularly in public with strangers (Marshall, 2014; Norgaard, 2011).

Both Terror Management Theory and the notion of cultural trauma avoidance also explain the reasons there is a "socially constructed silence" (Zerubavel, 2006) around the topic of anthropogenic climate change. The need to avoid pain in the form of "awareness of something particularly distressful" is the psychological explanation of denial (Zerubavel, 2006, p. 5). As described in Terror Management Theory, human psychology has evolved to keep disturbing information like death or the potential for cultural trauma out of our conscious mind. This ability becomes socially constructed when two or more people jointly avoid acknowledging something by remaining silent (Zerubavel, 2006). Mutual denial avoids acknowledgment of fear, shame, or embarrassment. Socially constructed silence can be necessary to keep terror at bay or enable us to ignore impending doom. Silence is also useful at times in lighter social interactions. It can minimize friction, prevent conflict, and allow others to save face. All of these uses of socially constructed silence come into play regarding park ranger interpreters and conversations about anthropogenic climate change.

Understanding the strong social psychological forces acting on us to avoid thinking, much less talking, about anthropogenic climate change, combined with our innate socialness and the powerful influence of our groups on us as individuals, we see that many forces may be acting on park ranger interpreters' willingness to engage in climate change conversations. I chose the possible impacts of staff group dynamics as the magnifying lens through which to examine staff member's individual willingness to talk about climate change. I decided a qualitative, interview-based method of investigation would be the best approach to uncover the experiences of park ranger interpretive staff on this subject.

Methods

For my research I chose to conduct interviews using phone and the Zoom online platform due to ongoing coronavirus pandemic, as outlined below. My methods and interview questions were approved by The Evergreen State College Institutional Review Board in December of 2020.

I broke my interviews into two sections. I first requested interviews with two experts I thought would give me a strong foundation going into my study of the possible impacts of staff group dynamics on park ranger interpreters' willingness to engage in climate change conversations. The first expert interviewee was my improvisational theater instructor. Principles and techniques from improvisational theater have been the basis of how I have handled climate change conversations at public lands visitor centers. My second interviewee was a supervisor from a public lands visitor center where I had worked for multiple seasons. I sensed he was adept at putting together staff members each year and bringing those individuals together to form a group. Since group structure and dynamics provide clues about staff member willingness to talk about climate change, I wanted to interview this person at the start.

After securing these first two interviews, I sent out an email requests for interviewees to my online climate change communication network. From this group, two supervisors expressed interest in being interviewed for my study.

As I concluded those interviews, I realized I would have to directly solicit interviews from frontline park ranger staff interpreters to get their perspectives. I used Facebook to contact park ranger interpreters that I knew but had not worked with directly. I also requested an interview with a park ranger with whom I had worked. I specifically wanted to interview her because I remembered her saying something interesting regarding anthropogenic climate change.

I took handwritten notes during the interviews. Handwriting notes slowed down the flow of the interview allowing me to adjust direction and to pause when I needed to gather my thoughts. The questions focused on responses to the stories I expected respondents to tell me about their climate change conversation experiences (Appendix A). I also asked questions regarding staff group dynamics. During an interview, I might take several different paths depending on their staff position and what they were telling me. It was wonderful to conduct these interviews. In my experience, park ranger interpreters tend to be outgoing people, comfortable in conversation. It is a job for people who like to talk. I gleaned all kinds of interesting information but no detailed, emotive stories of climate change conversations.

To analyze the responses from my interviews, I followed Braun and Clarke's (2006), Using Thematic Analysis in Psychology. I used a realist, theoretical approach with a semantic level. A realist thematic analysis allowed me to take the participants' experiences and responses in a straight-forward way. I could theorize motivations for those responses and experiences from the broad social psychology literature and, specifically, the social psychology of groups and of anthropogenic climate change. I determined themes by coding the individual data extracts (individually coded points of data within interview responses), then organizing the data extracts into similar groupings based on my research interest of anthropogenic climate change conversations and group structure.

This process involved many iterations of data review. As I wrote up the results and discussion, I found I had to consistently re-process the data to make certain that I was interpreting and analyzing in ways that was reinforced by the data. In other words, I ensured that my analysis results were accurate and supported my conclusions.

Results/Discussion

This section contains the results from my interviews and personal communications occurring between February 20th and May 12th, 2021. Direct quotes are included in my narrative interpretation of the communications.

The first section is composed of communications about climate change conversations. The next section is on group dynamics and includes group cohesion and interdependence. These first two sections explore my results in terms of my research question regarding possible group impacts on climate change conversations. The final section is a short section remarking on my own experience with a climate change conversation that occurred during the study.

Climate Change Conversations

I expected to listen to detailed and emotional stories of park ranger interpreters having conversations about anthropogenic climate change as I conducted my interviews. I designed my interview questions based on hearing climate change conversation stories. My questions included how the conversation started, was it a genuine conversation or a rant, which techniques the interpreter used to handle the situation, whether they felt supported or not by coworkers, etc. I did not get the type of climate change stories I expected.

Instead, I heard of how prepared park ranger interpreters are to handle climate change conversations and how much practice they get with other controversial subjects that come up while engaging with visitors. I heard from a supervisor who incorporates seasonal trainings and presentations on the climate science for her staff as well as schooling in de-escalation techniques. Another interpretive supervisor told me how he has learned to manage climate change conversations with trainings in metaphor, values, and causal explanations from organizations like the National Network for Ocean and Climate Change Interpretation, Nature’s Notebook, National Park Service, regional certified interpreter conferences, and conversational skills utilizing the red, yellow, green concept of gauging emotional interaction (Brochu & Merriman, PhD., 2006; *National Network for Ocean and Climate Change Interpretation - NNOCCI | Climate Interpreter*, n.d.; *Nature’s Notebook | USA National Phenology Network*, n.d.; NPS Climate Change Response, 2013) . He told me his mottos of, “question, rather than argue”, “keep it personal”, and remain “non-confrontational". He focuses on “customer service”, understanding that visitors mostly want to feel heard in their complaints. He has had lots of experience dealing with “touchy subjects” due to working at a government owned fish hatchery that sits in the middle of rural ranching land, yet close enough to large cities to get a mix of visitor perspectives and to recruit as workers environmental science students straight out of college. On top of that, his facility hosts a salmon festival, Earth Day celebrations, and a three-day Sportsman’s Expo. Water shortages, who gets how much, and who is to blame are the most common controversial subjects he and his staff experience. His young environmental science educated staff live in the reality of human-caused climate change. “Climate change colors their work; it is the lens” through which they see environmental processes. When we broached the subject of climate change denial in our interview, he said, “Confronting fake news, bad science – where the line is, is really shaky…to challenge or not? How far do you go?” People have a “right to be wrong”.

A frontline employee told me that due to her extensive education in geology and climatology, she is “not worried about messing up with the facts”. In fact, her confidence is so indisputable, she gets a sense visitors think, “We don’t want to argue with this woman!” She can tell which visitors are interested in “conversation versus here to fight” and has confidence in her “conflict resolution skills” if it comes to that. The most common of the controversial subjects she has handled are “creationist, anti-science ideas – geology versus God”, such as the age of the earth and the age of fossils in geologic time in contrast to Biblical accounts. This interviewee sees controversy and distrust coming from “feelings of deception” caused by the “nuances and mutability” of the scientific process. As a park ranger interpreter, she tries to “advocate for science transparently” showing people that they haven’t been lied to, “science was simply changing as it often does.”

Climate change conversations are expected by interpreters working at public lands with clear evidence of anthropogenic climate change. These sites showcase records of climate impacts such as photos of shrinking glaciers and decreasing snowpack levels. An interviewee who worked in the past at a glacial park stated that changes at that site were “very evident”. “It was visual, so people got it” she said. She told me that since the 1960’s park ranger interpreters and visitors have had to hike further and further to reach the retreating glaciers. At the end of the hike, park ranger interpreters traditionally gave a twenty-minute talk ending with actions visitors could take to reduce the carbon emissions heating the planet and slow glacial melt. She felt the program was a success and reached lots of people. Recently the park came under intense media attention due to the removal and correction of signs in the park stating the glaciers would disappear by the year 2020 (Bolton, 2020; CNN, 2020; Roots, 2019). The projected glacial disappearance date was wrong. The glaciers are shrinking, but they are still there.

This interviewee felt that since the climate change denial and media uproar over the incorrect forecast of glacial disappearance, park ranger interpreters tended to “shy away” from bold climate change interpretive programs calling on visitors to “take action”. A ranger posted his 2007 version of this very program on the internet (Hair, 2007). Interestingly, his conclusion states, “One of the most important things we all can do is to start really talking about climate change and how we play a role in it…” (Hair, 2007, p. 4).

A supervisor at a different site with evidence of anthropogenic climate change stated that the controversy around “climate change…doesn’t come up as frequently” because they do not provide as many programs about climate change and the programs do not have a big climate change theme. The supervisor notes that when climate change is in the program, the program interpreter “seems to get some negative feedback…some push-back”. One interviewee mentioned that her visitor center displays photo evidence of climate change which leads visitors to ask questions of park rangers, but no interaction was particularly memorable to her.

An interpretive staff ranger at a geologic park showcasing fossils from past catastrophic climate changes noted that today’s climate change is often “absent from other interpreters’ informal programs”. She says that she senses a “hesitancy” and “complacency” on the part of staff even though their site is a perfect place to talk about past and current climatic changes.

Another frontline staff interpreter said she does not use the phrase “climate change until she knows the visitor’s personality”. She has had “formal training on de-escalation” and experience “dealing with unhappy people in college”, but the controversial topics she faces at work are not for the faint of heart. She currently works at a historical park site where she says, “People have strong reactions.” Historically at her park, “…the biggest controversy interpreters run into is the Founders [of the United States] and religion. Some visitors “…assert the Founders were much more religious than they were, assert that Christianity had a much bigger impact on the Founding Documents than it did, and get really perturbed if rangers fail to ‘address that role’…Bringing up slavery in any context is another one…” Historical figures revered in United States’ history are “bigger than life” to many visitors. “They don’t think of [him] as a person.” At the time of our interview, face masks were causing the most controversy.

One supervisor understood, as instructions “passed down from above”, that research on public lands connected to anthropogenic climate change was to stop and that he was to tell his staff not to talk about climate change during the Trump administration, 2017 - 2020.

The interview responses included only one I would classify as a ‘climate change conversation story’. A supervisor spoke of conversations, both verbal and written, with her frontline staff interpreter who had doubts about attributing climate change to human activity. The supervisor then provided trainings and presentations on the science of climate change to the staff “that convinced” and had a positive effect on this employee.

One respondent saw parallels between a different contentious issue and anthropogenic climate change. She described the experience of working in a public lands' facility during the COVID pandemic as a dress-rehearsal for the job during extreme climate change events. Her visitor center stayed open with "no central guidance for appropriate behavior during COVID" causing conflict with "visitors who refused to wear masks" leading to health concerns for some of the staff. This interpretive staff member stated that aspects of the COVID illness and protocols were "contentiously discussed among the staff" at the visitor center. She saw potentially the same situation occurring in the future as climate change impacts in the United States become more apparent. Another interviewee said she appreciated that her visitor center closed during the COVID-19 outbreak, but she was angry at the National Park Service for keeping Grand Canyon National Park open so near to areas hard hit by COVID such as the Navajo Nation.

No one cited climate change as the most *common* controversial subject that arises at their parks, although one supervisor said climate change was a "close second, and more heated", no pun intended, I am sure.

In practical terms, anthropogenic climate change should be the most important controversial topic discussed at public lands visitor centers. Climate change impacts all people and all public lands. Interviewees richly described the daily reality of other controversial topics that arise at public lands visitor centers. I am inclined to attribute the lack of climate change interaction stories to the overall reluctance of people to talk about climate change, especially in a visitor center atmosphere. I examine aspects of the visitor center atmosphere that discourage climate change conversations in a later section.

Extensive research describes this social and cultural phenomena (Burke, 2016; Campbell, 2018; Marshall, 2014; Norgaard, 2011; Randall, 2012). Comprehensive social psychology theories such as Terror Management Theory and the notion of cultural trauma avoidance mentioned in my literature review are two compelling perspectives regarding our general reluctance to engage in anthropogenic climate change discussions. Psychological forces for avoiding climate change conversations are mostly subconscious and cultural norms of attention, emotional management, and conversation impact engagement on this crucial topic in non-rational, unproductive ways (Dickinson, 2009; Fielding et al., 2014; Norgaard, 2011; Pyszczynski et al., 2010).

Group Dynamics

Group Cohesion

The interview with the improvisational theater instructor and the interview with the public lands visitor center site manager were almost entirely about group dynamics. The improvisational instructor’s responses illuminate what improvisational principles and techniques contribute to positive, productive staff group dynamics as well as positive interpersonal interactions between staff and visitors. Improvisational theater principles and techniques covered in the interview responses include status flexibility to de-escalate confrontational situations; encouraging empathy in interpersonal interactions; following the lead of the other in the interaction; placing importance on being present with the other rather than being an authority; and stimulating divergent thinking in organizations.

The public lands site manager detailed specific ideas of creating an interpretive staff group capable of covering a wide selection of visitor interests, “accommodating a variety of tours”, since exploration of his site and visitor center is based on park ranger interpreter led tours. His response included focusing on learning and curiosity; crisis and remote location pulling staff together; looking for and encouraging a diversity of ideas, experiences, and backgrounds rather than “labels” for diversity; setting expectations with clear goals, a sense of purpose, and clarity around how goals tie into overall mission of agency.

Positive descriptions of group structure were common in the interviews. All three interviewees in supervisory positions revealed thoughtful efforts to build interpersonal safety, a comfort level in speaking one’s mind (Edmondson, 1999, 2011), and cohesion amongst staff members. Two of the three described the importance of connecting to staff members and encouraging them to care for each other due to the remote locations of their sites. All three described “demonstrating that it is safe to open up” with the “touchy-feely stuff” and that a “vulnerable level” can “pull people together”. Mentions of “open dialogue” and “eliciting conversation” describe purposeful intention to create a work environment where people feel safe to speak up and be themselves. Phrases like “shared experience and understanding” and “finding common ground” describe techniques of encouraging staff group cohesion. “Play to people’s strong suits” suggests creating interdependence in the group structure as does statements like “take care of each other”, “team effort”, “important to support each other on the basics” and “going to others for help”.

Group Member Interdependence

Frontline staff interviewees described group structural interdependence when creating their own “niches” in their staff groups based on their expertise, either technical, experiential, or people management skills. One staff member spoke of proactively declaring her niche on the team by asking fellow staff members to “please send [her] all rock questions”. She actively defined her role as a “geology helper”.

A park ranger interpreter brand new to the job, but an expert through life experience, described “feeling important--knowing stuff and relaying it to others” and learning more of her own history as she shared her culture with many park visitors unfamiliar with her culture. She was pleased finding the “majority of people open-minded, open to learning” and that she could respond by being able to educate them. She filled an important niche in public lands visitor staffing.

Another park ranger interpreter made clear throughout our interview that she focused on relating to people. She remarked that visitor center topics in which she is *not* a scholar gave her an advantage as she “better relates to visitors, especially foreign visitors” by using creative metaphors. She has made her niche through being reliable, on time, and being able to engage visitors waiting in long COVID restriction lines with informal interpretation of the park’s resources.

Creating an “expert” niche on the park staff is not always easy. While one interviewee remarked that it is “very exciting to be an expert --fun!”, she also described the dark “underbelly of lacking respect” if one does not have the academic background to define a niche.

Off-handed remarks on the less positive aspects of group dynamics also emerged. When asked about staff members she would trust to confide in following a difficult interchange with a visitor, one respondent named staff in order of trust until reached a staff person she would NOT confide in saying, “There’s always one!” Another respondent described the competition for attention – to become the “favorites”. In a large public visitor site such as hers, this park ranger interpreter stressed the importance of “supporting each other on the basics”. Being on time is important. There are “real consequences” that can get you “alienated because of being irresponsible”.

Group Dynamics Meets Climate Change Conversation Avoidance

I convinced myself ahead of time that I was interviewing the public lands visitor center site manager only for information about his ability to bring together individuals and create a staff team out of them. I planned a set of questions focused on his techniques and goals when building and guiding staff. At the end of our interview, I asked him if there was a topic that I did *not* ask him about that he would like to address. He answered, “Yes, climate change. Isn’t that in the title of your thesis?” I was quite embarrassed! I had subconsciously avoided the topic because it could potentially lead to a less than positive interaction! I had a sense from our past working relationship that he and I might be on opposite sides of the fence in terms of our perspectives on anthropogenic climate change. Because he is a leader I greatly admire, I held back from asking him about the main subject of my thesis. This choice between a positive interaction and an informative but potentially uncomfortable discussion is familiar for most park ranger interpreters and greatly impacts their willingness to engage in climate change conversations.

Customer Service or Educating the Public?

The supervisors and frontline interpretive park rangers I interviewed share the idea that the group dynamic most impacting park ranger interpreters’ willingness to engage in climate change conversations is the dynamic that occurs between the park ranger interpreter and the visitor or visitors. In other words, it is this small group interaction, and the fact that the interaction is predisposed, expected, and intentionally designed to be positive that influences whether a park ranger is going to engage in a conversation about anthropogenic climate change.

The interaction is predisposed simply because it involves humans, and it is human nature to socially connect to others (Aronson & Aronson, 2018; Fiske, 2018; Lieberman, 2013; Tomasello, 2014). It is expected to be positive because we have a set of socially appropriate behaviors, depending on context and culture, that make up our expectation of "customer service" (Tickle-Degnen & Rosenthal, 1990). And finally, it is intentionally designed by the job requirements of park ranger interpreter.

Park ranger interpreters understand their role to be "visitor experience specialists" who "provide orientation, information and inspiration in the right amounts and at the right times so that visitors will have more enjoyable, meaningful and complete experiences" (Bacher et al., 2011, p. 2). Interpreters I interviewed understand their job description on two fronts: to practice good customer service, fulfilling the enjoyable interaction aspect; and to educate on, and relate the site to the visitor, fulfilling the meaningful and complete aspect.

Customer service can be described as a positive interaction especially in a service context, such as park ranger interpretation services, "where a high amount of customer-employee interaction is required" (Gremler & Gwinner, 2000, p. 3). The customer's evaluation of the customer-employee interaction is particularly important to service encounters because of the intangible nature of the transaction (Gremler & Gwinner, 2000). There is no tangible object exchanged. This makes customer satisfaction more reliant upon the individual employee and the quality of the relationship between the employee and the customer as they co-create the experience. In the case of public lands visitor centers, the employee is the park ranger interpreter, and the customer is the visitor. The "positive" aspect of the interaction is the "mutual friendliness and caring" initiated by the employee interpreter and maybe continuing into a personal connection (Tickle-Degnen & Rosenthal, 1990). This potential personal connection begins with the interpreter's genuine interest in the visitor. It goes beyond merely being attentive. Genuine interest implies "a higher level of relational development, one that is more likely to result in a personal connection" (Gremler & Gwinner, 2000, p. 13). Making a personal connection to the visitor is more likely to lead to a positive service experience for the visitor (Gremler & Gwinner, 2000; Tickle-Degnen & Rosenthal, 1990). Improvisational theater principles and practice focus heavily on the other, the partner. Thus, park ranger interpreters who practice improvisational theater are well-prepared to be genuinely interested in visitors and able to make that personal connection.

This does not mean that every interaction must be focused on only happy topics. Many important public lands sites attract visitors due to their emotional and historical salience representing tragic but meaningful stories. Being friendly and caring can mean being compassionate and understanding when visitors experience strong emotions due to the content of the site. For example, I worked at a visitor center close to a place where many Native Americans were massacred by the United States Cavalry in 1890. Visitors often came straight from that landmark to our visitor center, some of them in tears. Our interactions were not focused on cheerful, happy topics. However, we made personal connections based on mutual friendliness, warmth and caring resulting in a positive, meaningful experience for the visitor, even though it was made sharing a sadness. The key was the "shared" part. Experiencing a "shared meaning" or developing a genuine interest in the other party are ways to personally connect (Duck, 1994; Gremler & Gwinner, 2000).

Interview comments like, "I don't use the words, 'climate change' until I know the personality" and regarding "brown grass as a climate change example: you can describe, but let visitors interpret their own conclusion" suggest the conversation danger zone that is climate change. Climate change science has become tainted with social meaning as a group identity marker meaning it can identify if you are part of somebody's group or part of the opposing group (Marshall, 2014). This is a forceful aspect of human group dynamics (Aronson & Aronson, 2018; Fiske, 2018; Forsyth, 2018).

I interpret 'knowing someone's personality' as possibly meaning knowing their identity group. It might be easier to personally connect through "shared meaning" and "mutual friendliness and caring" if you have not crossed into the other's opposing group category. A strategy for handling climate change conversations often suggested to park ranger interpreters is "finding common ground" or "shared values" (Hvenegaard et al., 2016; Kenworthy, 2010). It is easier to find shared meaning if you are within the same identity group or have "psychological similarity" (Duck, 1994; Gremler & Gwinner, 2000). Where one stands on the veracity and urgency of addressing anthropogenic climate change is an immediate identity marker (Marshall, 2014). If an interpreter is unsure of belonging to the same identity group as the visitor, the interpreter might look for common ground in other human interests and values, and refrain from discussing anthropogenic climate change outright.

Training for a park ranger interpreter stresses the importance of facilitating emotional and intellectual connections between the visitor and the "resource" or site (Bacher et al., 2011; Kryston, 2011). Freeman Tilden, considered to have written the first instructions on interpretation, coined the phrase, "People will care for, what they care about" (Tilden et al., 2009). Interviewed park ranger interpreters stated this understanding of their job's purpose with statements like, "Park visitors should have a good experience", "key in our job is to make it relate", and "keep it personal".

National Park Service Foundation Curriculum for Interpreters explains that interpretation supports the National Park System's mission to conserve wildlife and natural and historic places, "by introducing visitors to meanings and ideas, while allowing them to retain and express their own values" (Bacher et al., 2011, p. 9). The original educational objective of the National Park Service drafted in 1918 boldly directed parks be used to "educate the public in respect to the nature and quality of the national parks" and to "further the view of the national parks as classrooms and museums of nature" (Pitcaithley, 2002). While not all public lands visitor centers are part of the National Park System, they all draw interpretive staff training from the National Association of Interpreters which aligns and shares training and principles directly with and from the National Park System (Bacher et al., 2011; Brochu & Merriman, PhD., 2006).

There is also the "public" part of public lands. Public lands are owned and managed by the U. S. government for all its citizens (*Definition of PUBLIC LAND*, n.d.; Parris, 2018). It makes sense that visitors to public lands feel free to express their opinions and perspectives at visitor centers that can be said, in the broadest sense, to belong to them.

One supervisor pointed out that "visitors can have opinions" while the staff must remain neutral. At his site, visitors are encouraged through interpretive exhibits and guided tours to consider which explanations make more sense to them and add their own thinking. This makes this site strongly visitor centered. The interpretive tour guides are encouraged to "describe, but let visitors make own interpretations of the descriptions". In particular, the staff interpreters should keep to "standards of training in customer service" and "make the visitor feel heard".

Another supervisor remarked that visitors want to "feel like [their complaints] are heard". A frontline staff interpreter commented on the same thing saying visitors respond to, "I hear you.

I understand your concerns”. Even when those concerns are challenges to the science or academic-based facts being presented at the visitor center.

Also, people have a “right to be wrong”. A science educated interpretive interviewee said that to her, climate change denial is a conspiracy theory, but “you do not discriminate on perspective. I’m here to do my job – not make a statement”. A park ranger interpreter at a historical site spoke of the conflict between historical facts and “mythology” for many visitors. Visitors have their cherished beliefs about the founding of the United States and the key people in that endeavor. For many Americans, George Washington is “bigger than life” according to one interpreter. “He is a hero – almost God-like to visitors. They don’t think of him as a real person” so some historical facts about him can be upsetting and cause conflict with some visitors.

The decision of “where the line is, is really shaky”, especially when it comes to deciding where that line is in the moment that the conflict occurs. A park ranger interpreter must decide if they should push for their facts or if they should provide the listening ear in that one moment and where along that spectrum they should fall. A statement from an interviewee sums up the interviewees’ consensus with “Customer service trumps scientific information if the information is controversial”.

These combined inclinations and understood job requirements mean park ranger interpreters will determine their willingness and employ their ability to engage in climate change conversations heavily biased towards having a positive interaction with the visitor(s). Research tells us that conversations about anthropogenic climate change, while necessary, require us to override our innate, cultural, and social impulses to avoid the subject (Fielding et al., 2014; Geiger & Swim, 2016; Marshall, 2014; Randall, 2012). For park ranger interpreters tasked with talking about and educating on climate change while providing enjoyable experiences and facilitating positive emotional connections to the resource, this action is doubly daunting. Perhaps this study contains ideas for reducing this challenge in the future. First, however, I should state where my perspective falls in the tension between customer service and education directives.

Positionality Statement

I am a left leaning urban liberal. I am a white woman, tail end of the Baby Boomers. My formative years were during the late 1960's through the 1970's, raised by parents who thought creativity and the arts the highest expression of being human. This affects where I lean in terms of public lands interpretation.

The most important experiences for me working at public lands visitor centers have been facilitating creative engagement. I see creative engagement occur when a person forms new thoughts making new connections to their current thought structure.

Thus, the multiple perspectives sit easily with me if they involve a visitor's genuine creative endeavor. But as with most other people, when a perspective conflicts with my strongly held beliefs, such as the veracity and need for action on anthropogenic climate change, it is much harder to accept and respond with encouragement. Improvisation theater training, as exemplified by the improvisational theater instructor interview, prepares one to accept and encourage. I have allowed myself to "go in the direction taken" and have attempted to let myself by "altered" by the other person. I have utilized the "imaginary tug-o-war" technique (Johnstone, 1981), intuiting whether my conversation partners prefer to "win or lose" in our interaction. These practices have resulted in a preference for the "way we interact, rather than level of knowledge", as my instructor says, and could be interpreted as a preference for positive interactions, or customer service.

Conclusion

Taking a magnifying lens to the climate change conversations in public lands visitor center scenario helps us look at what is in play when we ask public lands interpretive staff to educate the public on anthropogenic climate change.

Interview responses answered my question of how staff group dynamics might impact individual park ranger interpreters' willingness to engage in climate change conversations at public lands visitor centers. Staff group dynamics seem overall positive. Staff cohere into groups sharing experiences and purpose. Individual staff members develop their own expertise niches then work together to cover the wide range of visitor questions, interests, and organizational needs. These two aspects, group coherence and interdependence, indicate healthy group structure.

I learned from my interviews that the group dynamic that strongly influences whether park ranger interpreters engage visitors in conversations about anthropogenic climate change is the interpersonal dynamic between the interpreter and the visitor or visitors. Park ranger interpreters view their job as providing positive customer service and education on the site. The interviewees frequently mention positive customer service as the guiding principle for interacting with visitors around potentially controversial subjects. The tensions between positive customer service experiences for the visitor and education about anthropogenic climate change put park ranger interpreters on the hot seat and can negatively influence interpretive staff's willingness to engage in climate change conversations.

Conversations about anthropogenic climate change can lead to feelings of distress and impending doom. People are naturally inclined to avoid these feelings and to avoid eliciting them in others when facilitating enjoyable experiences. People are especially likely to collaborate on socially constructed silence around climate change when uncertain of the others' group ideological identities or when certain that the identities are not compatible.

The root of the problem can shed light on solutions (Forbes Expert Panel®, n.d.). Acknowledging the general human reluctance to engage in conversations about anthropogenic climate change seems a good starting place to begin crafting the infrastructure and support necessary to nurture these conversations.

Nina Simon has a wonderfully clear, visitor-centered way of making welcoming public spaces. She describes museums as having doors that metaphorically say either "Welcome" or "Keep Out". In her book, The Art of Relevance, (Simon, 2016) she shows us how we often inadvertently select visitors with relevance markers that encourage some and discourage others. If we think about the visitors that we want to invite in and think about whether we are posting metaphorical "welcome" signs or "keep out" for them, we have a better chance of expanding the diversity or targeting a specific audience of people we want in the door. In fact, Simon uses an example of a Betty, an African American National Park Ranger who uses her uniform to indicate a welcoming door for children of color to the National Parks and the park ranger career.

Future research could include exploring what elements make up a "Welcome" door for climate change conversations. Do these conversations occur more frequently in semi-private spaces? Around tables? Outdoors? With park rangers who are older? Younger? Male or female? Who are the people we want to "Welcome" to these conversations? And what support, other than climate science training and de-escalation techniques, do front-line interpreters need to engage in these conversations?

Public lands visitor centers are places to have conversations about anthropogenic climate change. People feel visitor centers are community owned, and they love their parks and lands. I hope this research will contribute to allowing park ranger interpreters to fulfill all aspects of their jobs: providing positive connections with visitors and education on the sites while taking advantage of the opportunity to hold conversations about what could be the most important issue humanity will face.

References

Alexander, J. C., Eyerman, R., Giesen, B., Smelser, N. J., & Sztompka, P. (2004). *Cultural Trauma and Collective Identity*. University of California Press. http://ebookcentral.proquest.com/lib/esu/detail.action?docID=837285

Aronson, E., & Aronson, J. (2018). *The Social Animal* (12th edition). Worth Publishers.

Bacher, K., Baltrus, A., Beall, C., Cardea, D., Chandler, L., Dahlen, D., Kohen, R., Lacome, B., McCabe, J. F., & Scherbaum, P. (2011). *Foundations of Interpretation*. Bloomington, IN: Eppley Institute for Parks and Public Lands.

Balasubramanyam, V., Wilhelm Stanis, S., Morgan, M., & Ojewola, O. (2019). Climate Change Communication in the Midwestern United States: Perceptions of State Park Interpreters. *Environmental Management*, *63*(5), 615–628. https://doi.org/10.1007/s00267-019-01142-1

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497.

Becker, E. (2007). *The Denial of Death*.

Bolton, A. (2020, January 17). *Scientists Predicted Glacier Park&#039;s Glaciers Would Be Gone By Now. What Happened?* https://www.mtpr.org/post/scientists-predicted-glacier-parks-glaciers-would-be-gone-now-what-happened

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Brochu, L., & Merriman, PhD., T. (2006). *Certified Interpretive Guide Training Workbook*.

Brownlee, M. T., Powell, R. B., & Hallo, J. C. (2013). A review of the foundational processes that influence beliefs in climate change: Opportunities for environmental education research. *Environmental Education Research*, *19*(1), 1–20.

Brulle, R. J., & Norgaard, K. M. (2019). Avoiding cultural trauma: Climate change and social inertia. *Environmental Politics*.

Burke, S. (2016, March 2). *How do people cope with feelings about climate change so that they stay engaged and take action?* Is This How You Feel? http://www.isthishowyoufeel.com/2/post/2016/03/how-do-people-cope-with-feelings-about-climate-change-so-that-they-stay-engaged-and-take-action.html

Campbell, S. (2018, April 30). *ICYMI … On talking about climate change » Yale Climate Connections*. Yale Climate Connections. https://yaleclimatemediaforum.org/2018/04/icymi-on-talking-about-climate-change/

Climate Change in the American Mind: April 2020. (2020, May 19). *Yale Program on Climate Change Communication*. https://climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-april-2020/

CNN, C. M. and A. R. (2020, January 8). *Glacier National Park is replacing signs that predicted its glaciers would be gone by 2020*. CNN. https://www.cnn.com/2020/01/08/us/glaciers-national-park-2020-trnd/index.html

Countries | Climate Action Tracker. (n.d.). Retrieved June 4, 2021, from https://climateactiontracker.org/countries/

Definition of PUBLIC LAND. (n.d.). Retrieved June 14, 2021, from https://www.merriam-webster.com/dictionary/public+land

Dickinson, J. (2009). The People Paradox: Self-Esteem Striving, Immortality Ideologies, and Human Response to Climate Change. *Ecology and Society*, *14*(1). https://doi.org/10.5751/ES-02849-140134

Duck, S. (1994). *Meaningful relationships: Talking, sense, and relating*. Sage Publications.

Dunbar, R. (1996). *Grooming, gossip, and the evolution of language*. Cambridge, Mass. : Harvard University Press.

Dunlap, R. E., & Brulle, R. J. (Eds.). (2015). *Climate Change and Society: Sociological Perspectives* (1st edition). Oxford University Press.

Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, *44*(2), 350–383. https://doi.org/10.2307/2666999

Edmondson, A. (2011). Psychological Safety, Trust, and Learning in Organizations: A Group-level Lens. *Trust and Distrust in Organizations: Dilemmas and Approaches*.

Fielding, K. S., Hornsey, M. J., & Swim, J. K. (2014). Developing a social psychology of climate change. *European Journal of Social Psychology*, *44*(5), 413–420. https://doi.org/10.1002/ejsp.2058

Fiske, S. T. (2018). *Social Beings: Core Motives in Social Psychology, 4th Edition*. Wiley.

Forbes Expert Panel®. (n.d.). *Council Post: 14 Critical First Steps To Solving A Problem*. Forbes. Retrieved June 17, 2021, from https://www.forbes.com/sites/forbescoachescouncil/2020/07/16/14-critical-first-steps-to-solving-a-problem/

Forsyth, D. R. (2018). *Group Dynamics* (007 edition). Cengage Learning.

Garrett, T. J., Grasselli, M., & Keen, S. (2020). Past world economic production constrains current energy demands: Persistent scaling with implications for economic growth and climate change mitigation. *PLOS ONE*, *15*(8), e0237672. https://doi.org/10.1371/journal.pone.0237672

Geiger, N., & Swim, J. K. (2016). Climate of silence: Pluralistic ignorance as a barrier to climate change discussion. *Journal of Environmental Psychology*, *47*, 79–90. https://doi.org/10.1016/j.jenvp.2016.05.002

Global Energy Review 2021 – Analysis. (n.d.). IEA. Retrieved June 4, 2021, from https://www.iea.org/reports/global-energy-review-2021

Gremler, D. D., & Gwinner, K. P. (2000). Customer-employee rapport in service relationships. *Journal of Service Research*, *3*(1), 82–104.

Hair, P. (2007, September 3). *Goodbye Glaciers*. Studylib.Net. https://studylib.net/doc/15341853/goodbye-glaciers

Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor, H. (1997). Terror management theory and self-esteem: Evidence that increased self-esteem reduced mortality salience effects. *Journal of Personality and Social Psychology*, *72*(1), 24–36. http://dx.doi.org.evergreen.idm.oclc.org/10.1037/0022-3514.72.1.24

Hulme, M. (2009). *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*. Cambridge University Press. https://doi.org/10.1017/CBO9780511841200

Hvenegaard, G. T., Marshall, H. J., & Lemelin, R. (2016). Hot Interpretation of Controversial Topics at Batoche National Historic Site, Saskatchewan, Canada. *Journal of Interpretation Research*, *21*(2), 45–62. https://doi.org/10.1177/109258721602100204

Johnstone, K. (1987). *Impro: Improvisation and the Theatre*.

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. https://doi.org/10.1038/nclimate1547

Kenworthy, J. P. (2010). *Changing landscape, climate, and life during the age of mammals: Interpreting paleontology, evolving ecosystems, and climate change in the Cenozoic fossil parks*. Oregon State University.

Kryston, C. (2011). *Meaningful Interpretation: How To Connect Hearts And Minds To Places, Objects, And Other Resources*. https://www.nps.gov/parkhistory/online_books/eastern/meaningful_interpretation/mi6b1.htm

Leahy, T., Bowden, V., & Threadgold, S. (2010). Stumbling towards collapse: Coming to terms with the climate crisis. *Environmental Politics*, *19*(6), 851–868. https://doi.org/10.1080/09644016.2010.518676

Leiserowitz, A. (2006). Climate Change Risk Perception and Policy Preferences: The Role of Affect, Imagery, and Values. *Climatic Change*, *77*(1–2), 45–72. https://doi.org/10.1007/s10584-006-9059-9

Lieberman, M. D. (2013). *Social: Why our brains are wired to connect* (First edition.). New York : Crown Publishers.

Linden, S. (2014). On the relationship between personal experience, affect and risk perception: The case of climate change. *European Journal of Social Psychology*, *44*(5), 430–440. https://doi.org/10.1002/ejsp.2008

Marshall, G. (2014). *Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change* (1st edition). Bloomsbury USA.

Moll, H., & Tomasello, M. (2007). Cooperation and human cognition: The Vygotskian intelligence hypothesis. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1480), 639–648. https://doi.org/10.1098/rstb.2006.2000

Mullen, Brian. (1991). Group composition, salience, and cognitive representations: The phenomenology of being in a group. Journal of Experimental Social Psychology, 27(4), 297–323. https://doi.org/10.1016/0022-1031(91)90028-5

NAI National Virtual Conference 2020. (November 10 - 13). https://nai2020.pathable.co/

National Network for Ocean and Climate Change Interpretation—NNOCCI | Climate Interpreter. (n.d.). Retrieved June 23, 2021, from https://climateinterpreter.org/about/projects/NNOCCI

Nature's Notebook | USA National Phenology Network. (n.d.). Retrieved June 8, 2021, from https://www.usanpn.org/natures_notebook

Norgaard, K. M. (2011). *Living in denial: Climate change, emotions, and everyday life*. MIT Press.

NPS Climate Change Response. (2013, December 5). *Climate Change in National Parks: The Role of Interpreters*. https://www.youtube.com/watch?v=wV_obr17hlM&list=PLr8uf42JALwdlZhXQFNTzI7sbGSaPPdtL&index=1

NPS Training—Climate Change Response Program (U.S. National Park Service). (2015). https://www.nps.gov/orgs/ccrp/training.htm

Parris, A. (2018, September 7). Your Guide to Understanding Public Lands. *REI Co-Op Journal*. https://www.rei.com/blog/hike/your-guide-to-understanding-public-lands

Pitcaithley, D. (2002). *National Park Service History: National Parks and Education: The First 20 Years*. https://www.nps.gov/parkhistory/resedu/education.htm

Poole, M. S., & Hollingshead, A. B. (Eds.). (2004). *Theories of Small Groups: Interdisciplinary Perspectives* (1st edition). SAGE Publications, Inc.

Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defense against conscious and unconscious death-related thoughts: An extension of terror management theory. *Psychological Review*, *106*(4), 835–845. http://dx.doi.org.evergreen.idm.oclc.org/10.1037/0033-295X.106.4.835

Pyszczynski, T., Greenberg, J., Solomon, S., & Maxfield, M. (2006). COMMENTARY: On the Unique Psychological Import of the Human Awareness of Mortality: Theme and Variations. *Psychological Inquiry*, *17*(4), 328–356. https://doi.org/10.1080/10478400701369542

Pyszczynski, T., Greenberg, J., Koole, S., & Solomon, S. (2010). Experimental existential psychology: Coping with the facts of life. In *Handbook of social psychology, Vol. 1, 5th ed* (pp. 724–757). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470561119.socpsy001020

Randall, R. (2012, December 5). *We need to talk about climate change, even if it's depressing – Rosemary Randall | Aeon Essays*. Aeon. https://aeon.co/essays/we-need-to-talk-about-climate-change-even-if-it-s-depressing

Roots, R. (2019, June 8). *Glacier National Park Quietly Removes Its 'Gone by 2020' Signs*. Watts Up With That? https://wattsupwiththat.com/2019/06/07/glacier-national-park-quietly-removes-its-gone-by-2020-signs/

Routledge, C., Ostafin, B., Juhl, J., Sedikides, C., Cathey, C., & Liao, J. (2010). Adjusting to death: The effects of mortality salience and self-esteem on psychological well-being, growth motivation, and maladaptive behavior. *Journal of Personality and Social Psychology*, *99*(6), 897–916. http://dx.doi.org.evergreen.idm.oclc.org/10.1037/a0021431

Shaw, M. E. (1981). *Group dynamics: The psychology of small group behavior* (3d ed.). McGraw-Hill.

Simon, N., & Moscone, J. (2016). *The Art of Relevance*.

Thibaut, J. W. (1959). *The social psychology of groups*. Wiley.

Tickle-Degnen, L., & Rosenthal, R. (1990). The Nature of Rapport and Its Nonverbal Correlates. *Psychological Inquiry*, *1*(4), 285. https://doi.org/10.1207/s15327965pli0104_1

Tilden, F., Dickenson, R. E., & Craig, R. B. (2009). *Interpreting Our Heritage* (4th edition). The University of North Carolina Press.

Tomasello, M. (2010). *Origins of human communication* (1st MIT Press pbk. ed.). Cambridge, Mass.

Tomasello, M. (2014). The ultra-social animal. *European Journal of Social Psychology*, *44*(3), 187–194. https://doi.org/10.1002/ejsp.2015

Tomasello, M., & Carpenter, M. (2007). Shared intentionality. *Developmental Science*, *10*(1), 121–125. https://doi.org/10.1111/j.1467-7687.2007.00573.x

Weyler, R. (2021, March 21). *“Social inertia: Why is change so hard?” —Rex Weyler*. Greenpeace International. https://www.greenpeace.org/international/story/46946/social-inertia-why-is-change-so-hard

Zerubavel, E. (2006). *The Elephant in the Room: Silence and Denial in Everyday Life*.

Appendix A

- Was it a two-way conversation, or was it directed more in one direction?
- How important did it feel to you to have the scientific knowledge to respond to the other person(s)?
- How comfortable did you feel if your coworkers could overhear? If your supervisor could overhear?
- How important to you is it that other staff members share your point of view on climate change?
- How important to you is it that the staff leader share your point of view on climate change?
- How clear is your workplace directive in terms of handling climate change interactions?
- Does your work group discuss climate change?
- Are there different perspectives on the topic or is everyone pretty much in agreement?
- If anyone has a negative or disconcerting interaction around the topic, do you discuss the incident in the work group?

  - How comfortable would it be to experiment with different types of climate change interactions?

  - How would you feel if a visitor corrected a statement you made about climate change?