

FRAMING CLIMATE CHANGE: EVALUATING ARTICULATIONS OF SUPPORT
FOR MITIGATION POLICY ALONGSIDE COMMUNICATION SCHOLARSHIP IN
WASHINGTON STATE

by

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ABSTRACT

Framing Climate Change: Evaluating Articulations of Support for Mitigation Policy alongside Communication Scholarship in Washington State

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This thesis research investigated questions regarding framing practices by mitigation supporters at Washington State legislative public hearings over the past ten years. The following research question was posed: *How has climate change been framed in practice over time, and how does this compare with recent scholarship on framing and science communication?* This was broken into the following three sub-questions: *How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?* Prior framing research has focused on framing effects through surveys, rather than framing in practice. This research used content analysis and coding in Atlas.ti to analyze ten years of public hearings on climate change mitigation bills. Videos were analyzed over time, and supporters were stratified into categorical groups for analysis. The results of this research showed differences in framing between speaker categories, and that moral framing used frames that may appeal more strongly to political liberals, in addition to changes in framing over time. These results are significant for establishing how specific groups frame climate change in practice, which could inform science communication experts in their outreach and education efforts.

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Chapter One: Why Does “Framing” Matter?

As global temperature increases since the preindustrial era approach one degree Celsius, and atmospheric carbon dioxide levels are nearing 400 parts per million, the criticality of large scale climate change mitigation also increases (Pachauri & Meyer, 2014). As negative impacts from climate change on both environmental and human systems are beginning to appear, such as more intense storms, ocean acidification, and water shortages, the lack of significant climate change policy movement is concerning.

The IPCC recommends an overall increase of no more than two degrees Celsius planet-wide. Current projections show a high likelihood of increases above four degrees Celsius by the turn of the century with current mitigation efforts in place. A four degree increase would likely lead to large scale food shortages, species extinctions, and large scale economic impacts, in addition to increasing storm intensity and events (Pachauri & Meyer, 2014). Mitigation actions must be targeted at reducing overall planetary temperature increases to at, or below the two degree Celsius threshold.

Globally, there has not been policy enacted that sets aggressive enough reductions. The Paris Climate Agreement attempted to set emissions reductions targets that individual countries would collectively meet. The emissions reductions set by the Paris Agreement are at the two degree Celsius marker, but the mitigation actions have been criticized as having a likely minimal impact on planetary warming (Lomborg, 2016; *Paris Agreement*, 2016). As one of the largest greenhouse gas contributors in the world, by expressing intent to withdraw from the Paris Agreement, the public lack of support for climate mitigation action from the United States at the federal level does not bode well.

At the state level, there has been some work done on emissions reductions policy. Some of these policies include the Clean Car Act and cap and trade policies in California, the Western Climate Initiative, and the Northeast Regional Greenhouse Gas initiative (“Cap-and-Trade Program,” 2018; “Clean Air Act Permitting in California,” 2018; “Reg. Greenh. Gas Initiat.,” 2018; “West. Clim. Initiat.,” 2018). While all important first steps, these policies alone are insufficient in fully mitigating climate change. Due to the complexity of implementation, and concerns regarding effectiveness and economic impacts, it is extremely challenging to meet the needs of many stakeholder groups while still making meaningful progress.

While agreement among scientists about the reality of anthropogenic climate change is at an all-time high, public acceptance and knowledge among the general public continues to lag behind (Cook, Ellerton, & Kinkead, 2018). Issues surrounding the communication of, and knowledge about climate change can have overarching impacts on policy development and implementation. Aside from the challenges of convincing the general public about the importance of climate change, there are issues surrounding the spatial and temporal aspects of climate change.

Climate change cannot be seen or touched, only interacted with as an abstract idea or concept (Fløttum, 2017). Weather is the closest representation of climate available, and climate science cannot directly attribute weather events to climate change, only the increasing severity and rate of these events. This makes an argument that people can directly observe very challenging to make, and less convincing. Other challenges, such as economic considerations, are also integral to climate change.

From an economic standpoint, climate change is a type of market failure called an externality. In essence, this means that the price of market products such as fossil fuels do not represent the true cost of their use to society. So instead to the fossil fuel user paying the cost of their use, all of society suffers the impact of use. This is what climate change mitigation policies such as carbon taxes are designed to address. By increasing the cost of fossil fuels, these taxes disincentivize use and integrate the true cost back into the economic system. There are many challenges when implementing taxes such as these, with political and social feasibility being high on the list. Aside from issues surrounding pushback to additional taxes, economics is designed to discount the future value of resources, such as environmental resources.

When attempting to pass long-term, large-scale mitigation actions, there is an assumption made about the high future value of what is being protected. This means the value of a forest, clean air, or water, is assumed to be worth the cost and effort put into its protection. In contrast, economic valuation relies on the assumption that future values are lower, or discounted, over time. These two different understandings of value are at odds with one another, and can cause strife when attempting to develop effective mitigation. Fields such as environmental economics have been working to reconcile these issues by managing and researching the externalities at work when valuing environmental resources, but challenges remain (Boyce, 2018; Lacroix & Richards, 2015; Marron & Toder, 2014; Ostrom, 1998, 2009; Ulph & Ulph, 1994). One such challenge would be how these issues are discussed, understood, and communicated.

Economics would be one such way to understand climate change, as would environmentalism. These different frameworks and understandings of climate change

could lead people to different conclusions. Among groups that work on climate change mitigation policy, there are certainly communication challenges that appear. While a scientist may be concerned about the parts per million of carbon in the atmosphere, a citizen may worry about the impact of climate change on their child's future. A politician may be concerned about the economic or political feasibility considerations, and an environmentalist could worry about biodiversity loss. These different methods of framing and understanding climate change can create communication errors. This is not because people do not care about climate change, but because how they approach and understand its importance and impacts are different.

Recent research has shown that instead of relying on hard evidence and scientific fact, people often revert to moral and social judgements to understand and solve difficult issues (Cook et al., 2018; Djupe & Gwiasda, 2010; ecoAmerica, 2013; Fahey, 2014a, 2014b; Hulme, 2009; Lakoff, 2010, 2016). How people communicate about climate change can impact how people feel about and interact with it. Specifically, how climate change is framed can have different responses across different audiences, such as Democrats and Republicans, and self-identified political liberals versus conservatives, in the United States.

Prior to discussing the preferences between these groups, I will explain the classification between self-identified political liberals and conservatives. The majority of work on climate change framing relies on surveys that ask about political affiliations, either Republican or Democrat, liberal or conservative. While Republican and Democrat are the dominant political parties in the United States, liberal and conservative are less easily categorized. While a person may identify as liberal, they may not identify as

Democrat. The same can be said for self-identifying conservative people, who may not identify as Republican. The definitions of these groups are somewhat abstract, and one specific person answering a survey may have a different definition of liberal than the next person. This lack of clarity among definitions creates some challenges when classifying people into groups.

While a simple self-identified liberal and conservative classification creates some issues among diverse groups, it is a spectrum that can be used to describe elected officials. Washington State legislators generally run and are elected on either a Republican or Democrat platform, despite the differences between individual people. While their perspectives and political views are more diverse and complex than the simple Democrat or Republican classification they fall into, this is how they identify themselves. If we take Democrats as falling generally into a self-identified political liberal spectrum, and Republicans as falling into a self-identified political conservative spectrum, it allows for research into these groups to be conducted. Although this method of classification doesn't allow for a more nuanced approach, and includes different definitions among different groups, it is the basis for prior work in this field. Based upon the previous research into framing effects and the already self-identified Democrat and Republican dichotomy apparent among legislators, it is the starting point for the research used for interpreting the results of this thesis.

Climate change framing and communication research has shown that Democrats and Republicans have different preferences for specific climate change frames, and that self-identified political liberals and conservatives have different moral frame preferences (Benjamin, Por, & Budescu, 2017; Graham et al., 2012; Graham, Haidt, & Nosek, 2009;

Lakoff, 2010, 2016; Schuldt, Konrath, & Schwarz, 2011; Villar & Krosnick, 2011; Wolsko, Ariceaga, & Seiden, 2016). These preferences range from specific term preferences between Democrats and Republicans, to overarching moral frames between self-identified political liberals and conservatives. This means when speaking to an audience such as the Washington State Legislature, which is comprised of those who fit into either the Democrat, Republican, or self-identified political liberal versus conservative spectrum, framing matters.

While framing an issue differently cannot and should not be used with the intention to influence people in a dishonest way (Djupe & Gwiasda, 2010; Lakoff, 2016), it can be a useful tool for communicating across differences. This means by reframing an issue in a way that might resonate more with a particular audience, it may be possible to communicate a complex scientific issue in a more understandable and relatable way. In the context of climate change mitigation policy, how supporters talk about climate change may impact how legislators perceive it.

Despite the importance of how climate change mitigation supporters articulate and discuss climate change, there is a substantive lack of information regarding framing in practice. Prior research has focused on framing effects among different groups, particularly in regard to their preferences to specific frames. There is not a body of work that focuses on how framing is occurring in practice, and how different groups discuss climate change. Studying framing effects without a firm understanding of what frames are used in practice may lead to the investigation of frames that are actually infrequently employed. Due to this gap in the literature, I identified the following questions for my research.

How has climate change been framed in practice over time, and how does this compare with recent scholarship on framing and science communication? This was broken into the following three sub questions: How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?

This question focused on the Washington State Legislature over the past ten years, from 2007 to 2017. By using the Washington Legislature as a case study, climate change mitigation policy hearings and discussion could be analyzed for different types of framing and science communication issues. Washington was selected due to several reasons including accessibility to data, and the number of previous climate change policy hearings. Washington has had several major climate mitigation bills fail in recent years, providing a body of data in the form of legislative hearing videos (“Bill Information,” 2018).

Despite the robustness of reports produced by the IPCC, and near unanimous agreement that climate change is caused by humans (Cook et al., 2018), Washington State has still not managed to pass a carbon tax initiative (Bernton & Le, 2018). Similar climate change mitigation initiatives, such as cap and trade policies, have also previously failed to pass (“Bill Information,” 2018). The increasing urgency to pass climate change mitigation policy may be compounded with the fact that science communication and climate change framing can distinctly impact perceptions of climate change.

These issues, combined with the ability to classify the intended audience of legislators as Democrats or Republicans, allowed for a clear investigation into climate change communication issues. This thesis used content analysis (Bernard, Wutich, & Ryan, 2016) to develop a coding system based upon prior research regarding climate change framing. Supporters were separated into different groups, including citizen, community group, elected official, governmental agency/public institution, NGO/nonprofit, private company, and union. Data were also separated into each biennium. These separations allowed for changes over time, and between different groups to be investigated.

This research found that climate change moral framing has leaned towards a self-identified political liberal framing, becoming increasingly liberal over time. This finding was based upon both the Moral Foundations Theory and State as Family models, which can be used to evaluate partisanship of framing (Graham et al., 2009; Lakoff, 2016). Other frame types have seen shifts in both content and attitudes since 2007. Each identified speaker category had differences in how frequently they employed each frame. For example, the NGO/nonprofit and citizen categories tended to use negative message framing more frequently than the other categories.

These findings are particularly important for several reasons. First, by identifying the groups that employ frames and science communication methods in ways deemed potentially less effective by the literature, it is easier to know who may need additional education about climate change communication. Second, by having a baseline understanding of how climate change is discussed, it can help guide future research about what specific frames are used, and their framing effects. Lastly, by identifying where

climate change framing is falling along a political spectrum, it can open up opportunities for discussion regarding areas to intervene with regard to framing among self-identified political groups.

There is no previous work on climate change framing and science communication in practice, or at the Washington State Legislature specifically. I would argue that this is a significant gap, particularly considering the wide range of work on science communication and framing in general. While it is absolutely useful and necessary to understand climate change framing effects and communication barriers, it is also critical to know if the recommendations in the literature are being adhered to, when, and by whom. This opens up the opportunity to understand how supporters are discussing climate change, and if there are differences among groups. We do not know if a wealth of knowledge is not being put into practice, which is a critical piece of the climate change communication puzzle.

This work will move through the initial review of literature focusing on climate change communication, framing, and social psychology. In my literature review, I will set up the rationale for my research question in more detail. This will be done by defining and analyzing different types of framing, including traditional, message, moral, and issue. The implications for these types of framing in the face of political parties and self-identified political affiliation will be expanded on, including the drawbacks of a dichotomous analysis. Science communication challenges and methods will also be explored and assessed, with particular regard to the issues of language when communicating about climate change. By exploring the background, definitions, and

prior research into climate change framing, I will prepare for the defense and discussion of my methods.

Next, the methods section will lay out how I completed my data gathering and research. Based upon the literature discussed in my review, I will explain and justify why I chose content analysis and coding as opposed to survey analysis. Since this work has not been previously been completed, I primarily relied on trusted social science methods as opposed to prior studies. The different groups of speakers were selected and defined based upon the hearing videos and how speakers presented themselves. Based upon the information given by each speaker, the specific groups were created and defined, such as those who presented themselves as citizens. Data was also organized by biennium to answer questions regarding changes over time. These methods allowed for the organization and presentation of my results.

The results section presents my findings by biennium, over the last ten years, and among different groups. There were also code co-occurrence tables generated to look for the intersecting occurrences of specific frames and different groups. By investigating the co-occurrence tables, changes over time are able to be carefully assessed based upon changes in group participation and rates of frame use. Additionally, quotes from specific speakers for certain frames are provided. These examples are used to illustrate specific instances of how each frame was articulated and identified.

The discussion section compares occurrences of each specific frame and frame type to the literature on framing. This analysis includes adjustment for co-occurrence among specific groups and frames, in order to prevent changes over time from artificially appearing due to increasing participation from certain groups. Next, this section moves

on to discuss overarching framing themes and science communication implications.

Finally, my conclusion reiterates my findings and thesis, focusing on the importance of continuing to study and explore climate change communication as a means to work across differences.

This thesis work observed differences in framing and science communication among varying supporter groups at the Washington State Legislature. Additionally, changes in framing over time were observed between 2007 and 2017. Climate change moral framing has leaned towards the self-identified political liberal persuasion over the past ten years, increasing in the rate of liberal framing over time. Specific frames have become more popular since 2007, with others falling out of use. These differences are significant for the fields of climate change framing and science communication, as framing in practice does not have a significant body of work. Additionally, as climate change mitigation action and policy become increasingly critical, so does knowing and understanding how people communicate about climate in policy hearings.

Chapter Two: Literature Review

I. Introduction

Communication as a field has a huge diversity of research and theory, encompassing all forms of communication, written, spoken, visual, and auditory, among others. The National Communication Association defines communication as “the discipline that studies all forms, modes, media, and consequences of communication through humanistic, social scientific, and aesthetic inquiry (“What is Communication?,” 2018)”. This work focuses on one specific theory in communication, the study of framing.

Falling into the discipline of communication is the study of framing. There are many different types of framing; for this work I primarily focus on framing in the context of language. However, this is not the only type of framing, as the field includes other types such as visual or media framing. Prior to discussing the more recent climate change framing research that this thesis relied upon, I will explore the history and background of framing scholarship. This information and context was largely provided by an extremely thorough literature review by Alberto Ardèvol-Abreu (2015).

Framing theory itself is involved in all four pieces of communication, the sender, receiver, the message, and culture (Ardevol-Abreu, 2015). *Figure 1: Communication Model*, below, illustrates the four parts of the communication model. This means how an issue is framed is not impacted by the topic alone, but also by many different factors that interact to create the framing. In the context of my work, this means that both the message and the audience are critical. If one of these factors is altered, the framing itself

is different and will produce a different result. With that being said, this work looked at the message content and framing itself, focusing on the consideration of the receiver of the message within the analysis portion. The sender was considered through the use of stratifying individuals into categories, largely for the purpose of looking at differences among the speakers, or senders.

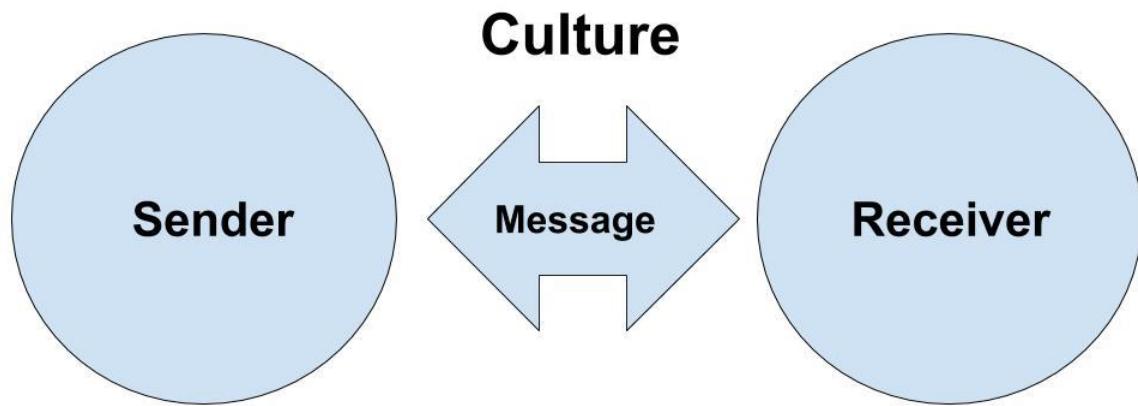


Figure 1: Communication Model

The term “frame” to describe this area of communication studies was originally used in 1955 by psychologist Gregory Bateson, arguing that a frame functions in a similar way to a picture frame. Not only does it include a message within its bounds, but it limits what is available in that message and explicitly does not include information outside of the frame. This definition of framing as a deliberate choice in both what is, and what isn’t included in the frame has been consistently reiterated throughout the literature. (Ardevol-Abreu, 2015).

Recent work, such as the work by cognitive linguist George Lakoff (2016) discusses the implications of choices made in framing with regard to explicit decisions to

exclude specific information to support a given agenda or purpose. This is critical to the study of framing, as the frames themselves not only reveal information with regard to what is selected as important, but what is left out. Additionally, framing itself has been solidified as an area of research in itself, moving from psychology, to communication and linguistics.

Framing as a theory in itself began in the 1970s by Erving Goffman, shifting from an individual psychological perspective to a sociological phenomenon. This entailed framing as a social and cultural experience, one that could be shared among people, as opposed to a specific individual experience (Ardevol-Abreu, 2015). This is critical to the evolution of framing theory, as it now applies to frames that are shared among groups as opposed to occurring on a strictly individual level. This means frames can exist and occur on a social and cultural level, relating to the four factors of framing. In the context of more recent work, audience segmentation and self-identification within groups is often used for analysis of frame preferences. This evolution of framing historically arguably set the precedent for research being carried out in this manner, since these groups could now have collective, sociological framing.

According to Ardevol-Abreu (2015) framing theory can be seen as developing in three stages. The first stage runs from 1974 to 1990, and includes the sociological basis of framing and its initial adoption into the field of communication. The second stage runs from 1990 to 2000, and includes the integration of framing into media studies. The current and third stage runs from 2000 to present, and includes the finalization of framing theory as a methodological research approach. This final stage is where the body of work

I draw on for my research was developed, with regard to research into specific framing effects among different audiences.

Framing is a more recent area of study overall, only emerging as a unified field in the last 20 years or so. Due to the more recent development of this body of work, this thesis contributes to an area of this field that has not been previously investigated. Specifically, the act of framing in practice has been largely passed over in favor of work focusing on framing effects. This sets the stage both in the context of the importance of this work and gap in the literature, and the previously established importance of climate change mitigation efforts.

Within this literature review, I will explore work on several different aspects and types of climate change framing. The identified frame types within this work fall into message frame, and are broken up as traditional, positive and negative (+/-) message, issue, and moral framing. Traditional frames focus on topic or subject matter, while +/- message frames consider the tone, good or bad. Moral framing looks to specific models of morality to establish the appeal of framing, while issue framing can be used to define all framing for a specific purpose, in addition to considerations about scientific communication. This is based on the organization and content of previous climate change framing research, with regard to the specific frames and information included. These types of framing will be linked to climate change communication issues and advocacy recommendations, in order to establish the background for my research into framing in practice in public hearings at the Washington State Legislature.

Frames can be used to connect people to ideas, allowing for a greater understanding of complex issues such as climate change. This is relevant regarding the

purpose of public testimony, to argue a point either in support or opposition to a specific bill. In regard to climate change policy, those who speak out in support of climate change mitigation will use frames to articulate their argument as it is unavoidable to articulate messages without the employment of frames. This thesis investigates how specific groups frame their argument, how framing has changed over time, and if these frames appeal to Democrats or Republicans, and self-identified political liberals or conservatives.

Knowing how framing is being used in practice can help inform the current literature on climate change framing, while climate change communication research could be informed by the communication methods utilized and by whom. While understanding climate change scientifically can help give us the tools to mitigate its effects, public testimony can help garner support and push through policy changes. Understanding the physical impacts of climate change cannot address the issues alone. Climate change will not be properly mitigated if we are not actively working towards shifting our policy and practices to limit potential damage.

But first, getting into the background and definition of what framing is will lay the groundwork for discussing the analysis and rationale. To start, I will define what framing is and what types of framing will be included within this thesis, then moving on to how climate change framing has been researched with regard to specific types of framing. Next, I will define cognitive linguist George Lakoff's (2016) State as Family model, which was used as a model for moral framing within the methods of this work. Third, I will discuss relevant advocacy and rhetorical recommendations from climate change advocates. Finally, I will establish the gap in the literature my work will fill.

This review is intended as a way to outline the different types of framing used when discussing climate change, and how they impact perception of the issue. Additionally, by outlining previous work on climate change communication and framing, I will articulate the strengths and weaknesses of previous research methodologies and approaches to framing. By doing so, I will establish both the rationale for my own methodological approach, and discuss the issues carried through from the body prior research I draw on.

II. But, What is Framing?

Framing in the traditional sense includes frames that focuses on a specific topic or subject, but are not linked to a specific model, tone, or political purpose. For the context of my work, traditional framing is used to address and investigate the topics or subjects being discussed. These frames can be investigated to reveal how an issue is being understood, such as the difference between the two different frames climate change and global warming. While climate change and global warming refer to the same phenomenon, the frame itself is different. The former is often seen as real, while the latter is often interpreted as being alarmist. If the speakers choose to discuss climate change, they are also making a choice to not discuss global warming. These two different frames may allude to differing stories about the reality of climate change, its impacts, and importance depending on both the speaker, and receiver. While the speaker may not have a personal strong framing effect or preference for one or the other frame, the receiver may. This is worth considering when articulating the frame itself, since communication includes multiple influences that could alter the framing.

The organization of *Table 1: Types of Framing*, below, was based upon the different research areas found within climate change framing literature. The established body of work focused on either topical, subject based, traditional frames such as climate change (Benjamin et al., 2017; Schuldт et al., 2011; Shanahan, 2007; Villar & Krosnick, 2011), differences between negative and positive message frames (de Vries, 2016; Gifford & Comeau, 2011), established moral frameworks such as Moral Foundations Theory (Graham et al., 2012, 2009; Wolsko et al., 2016), and issue framing, including all framing for a political or strategic purpose, in addition to recommendations from science communication experts (ecoAmerica, 2013; Fahey, 2014a, 2014b; Hulme, 2009; Lakoff, 2010, 2016, 2017; Somerville & Hassol, 2011). All of these types of framing are based in the message section of the framing system, with research studies looking at the effects of different message frames on audiences, or receivers.

Table 1: Types of Framing

Framing Type	Definition	Example
Traditional	A frame that focuses on a specific topic or subject but is not linked to a specific model, tone, or political purpose.	Climate change: This frame is generally seen as more real, scientifically accurate and accepted across party lines. Global warming: This frame is generally seen as less real, more catastrophic and alarmist.
Positive and Negative (+/-) Message	A frame that represents information in a positive or negative light. The difference between highlighting sacrifices a person will have to make, as opposed to the benefits they will get.	Positive: Mitigating climate change through investment in clean energy will generate significant contributions to the local economy. Negative: We will all need to start changing our lifestyles to reduce the impact of climate change, it will not be convenient.
Moral	A frame that appeals to a person based upon their moral framework or background. In this work, these frames are identified based upon specific models.	Liberal framing: An appeal based upon liberal values, such as equity and care for those in need. Conservative framing: An appeal based upon conservative values, such as the importance of strong leadership, economic efficiency, purity, and loyalty.
Issue	A frame that focuses on an issue for a specific strategic purpose, to achieve and define the issue in a particular way. This includes all framing and looks to how a specific speaker or communicator decides to frame an issue, what is included and not. Issue framing is frequently considered in science communication, with regard to frame choice and audience.	Issue frame: The framing of climate change in a negative light, as a moral issue of equity and care. This frame could be selected as an issue frame by an individual or group. All frames used can be considered issue frames.

While framing occurs within all four sections of the communication model, including (1) the sender, (2) the receiver, (3) the message information or content, and (4) outside influences such as culture, this work focuses primarily on the message content itself (Ardevol-Abreu, 2015). Prior research has identified and studied specific message frames, the third piece of the model of communication, which were used for the content

analysis portion of this work. These message frames were then exposed to different audiences, in order to examine framing effects among different receivers, the second section of the communication model. This information was used for the evaluation of frames in the context of what audience they may resonate with. Prior literature has articulated specific message frames in different ways, which were then organized into basic recurring categories used in *Table 1: Types of Framing* above. These different types of framing appear within research on climate change framing, such as different preferences for the frames climate change or global warming (Benjamin et al., 2017; Schuldt et al., 2011), or message framing preferences (Gifford & Comeau, 2011).

Traditional framing includes the specific topic or subject articulated within the framing, and is not linked to a specific model such as moral framing, or tone as with +/- message framing. For example, the difference between global warming and climate change is a commonly investigated frame within the literature (Benjamin et al., 2017; Schuldt et al., 2011; Villar & Krosnick, 2011). These frames include the topic or subject of climate change or global warming, which have potentially different meanings based upon the sender and receiver of the message. For example, a sender could discuss global warming or climate change as their message, which could evoke a different response from different receivers. Research has shown a preference for the climate change frame among Republicans, and little to no framing effect among Democrats (Schuldt et al., 2011; Villar & Krosnick, 2011) So the topic of climate change or global warming can be received in a different way, based upon the information in the message and the receiver of that message.

Cognitive linguist George Lakoff (2010) includes “semantic roles, relations between roles, and relations to other frames” (p. 71) in his definition of framing. Lakoff discusses the hospital frame through this language, highlighting that the frame would include roles such as doctors and nurses and their relationship to patients. The hospital frame can be evoked through language such as doctor or nurse, despite not explicitly stating the word hospital. This is an example of a traditional frame, focusing on the topic and subject of a hospital, as opposed to the potential for a negative message about hospitals, or the moral issues involved in medical care. Again, this framing involves the choice to discuss hospitals specifically, as opposed to outpatient medical care, revealing a choice about what to include, or not include. It is also critical to know a frame cannot be negated by employing it, we must use alternative frames instead.

“Don’t think of an elephant!” George Lakoff (2016) claims this as his way to explain framing to his students at UC Berkeley. It is crucial to consider the implications of using a frame with the intention of negating it. By using the elephant frame, Lakoff’s students think of an elephant and the associated frame, despite being told not to. This highlights how the word elephant evokes a frame of a large grey animal that lives in Africa (or a zoo) without the intent of the listener, and when told not to. This is important to keep in mind when we move through discussion of reframing later on in this literature review. Moving on from the more narrow definition of framing, there are broader definitions and applications throughout the literature related to climate change communications.

Message framing in general is defined as the content of a frame, Gifford & Comeau (2011), citing Chong and Druckman, defines it as “communication in words,

images and phrases for the purposes of relaying information about an issue or event” (p. 1301). All of the included types of framing fall into the message framing category, but for this work +/- message framing will refer specifically to a negative, or positive, message frame. This is based upon research investigating negative and positive message framing, which looked at the way a message about a subject, such as climate change, articulated the benefits or drawbacks (de Vries, 2016; Gifford & Comeau, 2011). While traditional framing focuses on subjects, +/- message framing in this research uses frames and language to discuss an issue in a positive or negative light. For example, the research conducted by Gifford and Comeau (2011) determined differences in preference for motivational or sacrificial frames regarding climate change. These frames focused either on the benefits the subject would get from climate change mitigation efforts, or the sacrifices they would have to make. For example, one of the motivational frames used was “My neighborhood will be a healthier place to live if we walk more to cut greenhouse gases” (Gifford & Comeau, 2011, p. 1303). On the other hand, a sacrificial frame used was “I am going to have less freedom to make the choices I want if we are going to solve climate change” (Gifford & Comeau, 2011, p. 1303). The +/- message framing was altering how climate change was framed, as opposed to changing the frame to something else, such as global warming. Although, looking only to what frame is used and if it is in a positive or negative light doesn’t encompass all of the types of framing used when discussing climate change.

Moral framing is a type of framing that appeals to a specific moral framework, such as a political party preference. To expand on the examples in *Table 1: Types of Framing*, appealing to a person through the self-identified liberal framework may focus

on climate change as an issue of equity, appealing to the fairness/cheating foundation found in Moral Foundations Theory (Graham et al., 2012), which is expanded on below. Similarly, discussing climate change through the lens of leadership would appeal to the authority/subversion foundation, which has been found to appeal more to self-identified conservatives (Graham et al., 2009). Shifting the moral frame without changing the traditional frame or subject has been found to increase conservative receptiveness to environmental issues (Wolsko et al., 2016). These different frames are appealing to different moral approaches to understanding the world, and can talk about the same issue in different ways. For this work, I use the models of Moral Foundations Theory (Graham et al., 2012, 2009) and State as Family (Lakoff, 2016) to discuss moral framing with regard to political preferences.

Moral Foundations Theory is a social psychology theory that evolved out of work developed in the late 1960s, coming to fruition in the early 2000s (Graham et al., 2012). This theory uses five basic moral foundations to explain overarching human morality, including care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and sanctity/degradation. More can be found on Moral Foundations Theory within the moral framing section of this review.

Similarly, though more dichotomous, is George Lakoff's (2016) State as Family model. This model is used to explain differences between political liberal and conservative ideologies. By using a nurturant versus strict model to explain liberals and conservatives, respectively, Lakoff explores the differences between morality and framing within those general groups. Additional information for Lakoff's model is found

within the moral framing section of this literature review. Moving on from moral framing, I will now explore and define issue framing.

Issue framing includes the framing of an issue for a targeted, specific, and often political purpose. This is the process in which a sender, speaker, or communicator constructs a message frame that directs the receiver to the core pieces or constructs of an issue (Slothuus & de Vreese, 2010). Framing for a specific purpose or movement is discussed by Lakoff (2010, 2016) within his work, as he emphasizes the importance of a uniform message to be sent in regard to environmental issues, and the history of the conservative party to create effective framings of issues. Pralle's (2006) "issue definition" involves the discussion of issue framing regarding the importance of rhetoric and language, claiming that manipulating symbols can generate different viewpoints or portrayals of an issue. Science communication has focused on framing and communication in relation to both the framing of the issue, and specific issues around the use of technical language (ecoAmerica, 2013; Fahey, 2014b, 2014a; Hulme, 2009).

Issue framing includes the specifically articulated overall framing of an issue, such as climate change, for a particular purpose. The different message frames within this work, broken up into their relative categories, do not paint the same picture as they do when taken together. If the top occurring frames among each group are identified and organized among the speakers, this can illustrate the overall narrative or framing used by each group. For example, someone may be creating an issue frame that uses the global warming frame, in a negative message frame, appealing to a conservative moral frame, while avoiding jargon as recommended in science communication literature (ecoAmerica,

2013). All of this information creates a narrative issue frame, revealing multiple choices by the speaker about what frames to include or exclude.

Climate change can be framed in many different ways, using different frame types. By investigating and interrogating these frames and their framing effects, we can further investigate better communication methods. However prior to that, how climate change has been framed in prior work must be investigated.

III. How is Climate Change Framed?

Message framing is a significant part of shaping how people perceive and interact with the world around them, and climate change perception is no exception. According to climate change linguist Kjersti Flottum (2016), people cannot experience climate as a physical manifestation as they can with weather, meaning they must learn about climate change through “cultural representations,” including language (p.2). This means that the interactions people will have with climate change are impacted by the language used to represent it. Therefore, the framing used to describe climate change will impact both individual and group representations and perceptions of climate change.

The related literature on traditional climate change framing is fairly contentious and still evolving, with early research including often single question analysis (Schuldt et al., 2011), and more recent research incorporating multiple measures of framing effects (Benjamin et al., 2017). The methods used in these studies are often surveys, using analysis of framing effects based upon groups, such as political parties. Linguistic analysis of climate change, such as the work done by Flottum (2016), often focuses on linguistic markers in climate change materials or language. Hulme (2009) explores the

importance of framing climate change within his work, evaluating and analyzing methods of climate change communication and frames. Studies done on +/- message framing, such as Gifford and Comeau's (2011) work on motivational versus sacrificial framing, looks to see how +/- message framing impacts climate change intentions. Issue framing includes all framing, looking in particular to framing for a specific purpose or narrative, often with science communication considerations.

III.I What frames are used and how?

Different traditional frames and +/- message framing methods and effects are discussed throughout the literature on frame preferences, science communication, and linguistics. These traditional frames include differences between the frames climate change as opposed to global warming (Benjamin et al., 2017; Schuldt et al., 2011; Villar & Krosnick, 2011), or specific frames used in media publications, such as the “polar bear frame” (Shanahan, 2007). Message (+/-) framing discussion includes preferences for motivational as opposed to sacrificial frames (Gifford & Comeau, 2011), or the influence of climate change denial frames on climate change acceptance (McCright, Charters, Dentzman, & Dietz, 2016). Initially, I will discuss the more traditional frames found within the literature, then moving on to +/- message framing. Moral framing will be explored through both Moral Foundations Theory (Graham et al., 2012, 2009) and Lakoff's (2016) model of State as Family, eventually coming to issue framing and science communication.

III.II Traditional frames

The traditional frames and literature explored within this section will highlight frames as defined within the traditional frame section above. Specifically, this means frames that include a specific topic or subject but do not rely on a specific model to define them, such as moral framing. Additionally, traditional framing does not include the tone of a frame, as +/- message framing does. These traditional frames could be for example, climate change versus global warming, or specific frames relating to the economy, or environment.

In a report by Shanahan on media representations of climate change, he determined the frames within *Table 2. Climate change frames used in the media and audiences engaged*, as the primary frames used when reporting on climate change. He also includes what audiences are engaged by these frames. While these frames look at media representation as opposed to public testimony, they arguably serve as a good basis for understanding different frames and audiences within my research.

Table 2. Climate Change Frames and Audiences (Shanahan, 2007)

Climate Change Frame	Audience Engaged
Scientific uncertainty	People uninterested in changing
National security	Scientific uncertainty audience, but becomes inspired to change
Polar bear	Animal lovers/wildlife groups
Money	Politicians and the private sector
Catastrophe	Alarmist or fearful audience, but confusing to most
Justice and equity	Those concerned by feeling powerless can be empowered by this frame

These frames can be determined through the language used when writing about climate change. For example, the Polar Bear frame could discuss climate change in the

context of wildlife losses or movements, while the Money frame could talk about negative economic impacts. In the context of this thesis, these frames could be used to inform or interpret the public testimony that will be the basis of this work. I have found no work looking for traditional framing in public testimony on climate change, so these frames were adapted as a basis for looking deeper into public testimony. Some additional frames from previous research to consider would simply be, the climate change frame versus the global warming frame.

Previous work on climate change framing has looked at preference for the different frames, climate change versus global warming. These two frames, while often used interchangeably, evoke different meanings (Schuldt et al., 2011). Global warming is more frightening than climate change due to the lack of human responsibility associated with the “change” (Lakoff, 2010). Global warming has also been framed as less real due to the imprecision of language (Schuldt et al., 2011). Climate change can refer more generally to temperature rising and falling, and weather changes, while global warming refers specifically to the rise of global temperature. Using these terms interchangeably has caused confusion and allowed global warming to become perceived as less real, since some areas of the planet will experience falling temperatures despite planetary warming (Schuldt et al., 2011). Some could ask, “How is global warming real, if some places are becoming colder? It must not be.” The differences in these frames and confusion surrounding them has led to research around these issues.

According to Schuldt et al. (2011) there are significant frame preference differences for “climate change” and “global warming” between Democrats and Republicans. This preference revealed itself with 60.2% of Republicans expressing

scientific acceptance of “climate change,” but only 44.0% expressed acceptance of “global warming,” with no significant difference for Democrats, 86.9% and 86.4% respectively (Schuldt et al. 2011, p. 120) Similar research by Villar and Krosnick (2010) found Americans perceive climate change as a more serious problem than global warming. The political importance of framing in Schuldt et al. (2011) certainly holds some significance with regard to understanding and scientific acceptance of climate change, which will be explored later within this review. For now, the importance of frame preference with single-question surveys was established within this research. This has been criticized by Benjamin, D., Por, H., and Budescu, D. (2017) for being an incomplete survey of framing effects due to its single-question nature. In response to that, I would offer that a single-question study, while not a complete assessment of attitudes between Democrats and Republicans, does still highlight how changing only one variable could lead to significant differences in framing effects. This is valuable information, even if it doesn’t completely evaluate the strength of the framing effect.

For a more refined survey of framing effects, Benjamin et al. (2017) propose that while partisanship may impact support for specific frames, those who do not have significant partisan preferences will be the most susceptible to framing. The authors developed a study that included additional measures of framing influences, finding that political independents or those who have unexpected views for their political parties, such as Democrats that do not trust that climate change is occurring, are the most susceptible to framing. They did not find dramatic framing effects between the terms climate change and global warming for Democrats and Republicans. The authors attest some of these differences to changes over time in the framing of climate change versus

global warming, and due to the incomplete nature of a single question measure as used in previous studies (Benjamin et al., 2017). I agree that a six-year difference between publication times could have an impact on frame preference, and that the single question evaluation may not be complete. However, I would again like to attest that a single-question answer can be informative about preference for the specific frame used, such as climate change versus global warming. That being said, it is crucial to emphasize that framing effects are not so simple as to use a different word or frame in order to change a person's mind about an issue. People and their preferences are more complex than just looking to a frame shift, such as global warming or climate change. This is important in the context of this work, since only looking for a specific frame, such as global warming or climate change, may not inform much about the overall argument or issue frame. In light of this, +/- message framing must also be considered when looking at framing overall.

III.III Positive and negative message framing

Positive and Negative message (+/-) framing as defined within this work and based upon prior research includes the positive or negative light a frame may be discussed in. Examples include motivational versus sacrificial framing (Gifford & Comeau, 2011), or positive framing (McCright et al., 2016). There is also discussion of a potential “boomerang effect” when only using a positive frame to discuss environmental issues (de Vries, 2016). These different methods of framing climate change have been shown to have differing effects on scientific acceptance and behavioral intent around climate change.

Framing a message in a motivating light as opposed to a sacrificial one has been shown as an effective method of increasing climate change engagement and intentions (Gifford & Comeau, 2011). This means highlighting the capability of individuals to make a difference in a motivating fashion, as opposed to the negative sacrifices a person will have to make. In the context of +/- message framing, motivational framing may be a useful tool to engage an audience further, as opposed to focusing on the sacrifices they will have to endure. Although, as the authors noted, this research focuses on climate friendly intentions as opposed to action, meaning we do not know if these frames actually change behavior or actions.

McCright et al. (2016) proposes that positive framing effects are too inconsistent to hold much potential for influencing climate change attitudes. The research they conducted looked at four different positive frames in relation to views about the impacts of climate policy, finding that the inconsistency remained for those who would very likely be responsive to the frame, and the general public. This means that positive framing may not have much strength insofar as influencing opinions about the positive effects of climate change mitigation policies. This is relevant for this research since it was in a policy related setting, regarding speaking in support of policy with the intent to influence opinion. Positive and negative frames are increasingly complicated when considering the “boomerang effect” proposed by de Vries (2017).

One recently proposed model, the “boomerang effect,” although untested, asserts that overt positive framing of low-carbon technologies without acknowledging the negative impacts could lead to eventual public mistrust of those using the positive frame (de Vries, 2016). This model is supported by related research, although it has not directly

been tested, causing some potential concern for the validity of the assertion. Despite this, I would assert that it is important to discuss in the context of +/- message framing, since positive message framing should not be used in a deceptive manner, or overzealously. If citizens or politicians feel like they are being deceived about climate change related projects it could significantly set back legislation due to a lack of support. It is also important to consider when looking at the potential lack of strength when using positive frames, as discussed above regarding the work done by McCright et al. (2016). If positive framing alone is not entirely effective, and it may lead to mistrust, this must be carefully considered when looking at +/- message framing. This leads to the consideration of moral framing, where additional models and complexities arise.

III.IV Moral framing

Frame preferences intersect with party affiliation and what is described as moral framing (Lakoff, 2016; Wolsko et al., 2016). Moral framing will be explained in more detail through the use of Moral Foundations Theory (Graham et al., 2012, 2009) in addition to Lakoff's (2016) State as Family model. For now, moral framing can be seen as framing through a moral lens, appealing to an audience based upon their moral preferences.

III.IV.I Moral Foundations Theory

Moral Foundations Theory, developed by Haidt and Joseph, proposes that human morality is based on five (with the possibility of including more) basic foundations.

These foundations are care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and sanctity/degradation. Others, such as liberty/oppression, have been proposed as well (Graham et al., 2012, 2009). These foundations are considered to be a product of human social evolution, with difference in preference for the importance of each foundation differing among societies and individuals. For the purpose of this work, I will focus on the five initial foundations researched within Graham's work, and the work by Wolsko et al. (2016) based upon it. I will discuss each foundation more in depth, and the implications for moral framing within this thesis.

Table 3: Moral Foundations Definitions

Code	Definition
Authority/subversion	This code refers to one of five moral foundations, the authority/subversion foundation. This foundation relies on the importance of leadership and deferring to authority.
Care/harm	This code refers to one of five moral foundations, the care/harm foundation. This foundation relies on empathy and the aversion to the pain of others.
Fairness/cheating	This code refers to one of five moral foundations, the fairness/cheating foundation. This foundation relies on the assumption that people should be treated equally and not allowed to cheat.
Loyalty/betrayal	This code refers to one of five moral foundations, the loyalty/betrayal foundation. This foundation highlights self-sacrifice and the importance of groups. It is associated with patriotism.
Sanctity/degradation	This code refers to one of five moral foundations, the sanctity/degradation foundation. This foundation relies on disgust and cleanliness, and the importance of preserving what is pure. It is associated with religious purity.

Table 3: Moral Foundations Definitions includes the definitions of each moral foundation. The first of the five foundations, care/harm, focuses on nurturance and

protection of victims or those suffering. This foundation values kindness and care for those who would be harmed or exploited by others. The second foundation, fairness/cheating, values justice, trust, and equity. The third foundation, loyalty/betrayal, values patriotism and self-sacrifice for the group. The fourth foundation, authority/subversion, values the structures of hierarchies, such as those who would be leaders and their followers. The fifth and final foundation, sanctity/degradation, values purity and cleanliness, seeing it as a virtue in itself (Graham et al., 2012). These five foundations have been found to be strongly empirically supported, and have had research regarding differences between self-identified political liberal and conservative's moral foundations.

Self-identified political liberals and conservatives have been found to place different value on the five moral foundations. While self-identified conservatives tend to place fairly balanced importance on each of the five moral foundations, political liberals show a strong preference for the care/harm and fairness/cheating over the remaining three foundations (Graham et al., 2009). Based on a self-identified spectrum, the extremity of these foundational preferences gets larger at the poles. This means an argument that relies on the care/harm or fairness/cheating foundations may resonate more with self-identified liberals than conservatives, particularly if they strongly identify as liberal. When looking at political preference, this would certainly apply to the preferences these groups have for policy, such as the liberal platform of welfare programs and strict environmental policy (Lakoff, 2016). This also means shifting the moral framing of an issue may also alter responses based on political preference. One such study found that when exposed to an alternate framing of an environmental issue based upon the moral foundation of

loyalty/betrayal, political conservatives responded with much stronger pro-environmental attitudes (Wolsko et al., 2016). Though this research used a model for identifying people along a liberal versus conservative spectrum, rather than self-identification, it still found frame preferences that align with prior work. In the context of this thesis, political parties and moral foundations are particularly relevant to the framing of climate change.

Despite these findings, classifying people on a simple political spectrum to apply generalizations about morality is unlikely to capture the full complexity of individuals. This means that specific individuals in public hearings may respond differently than expected based upon the political spectrum used for this analysis. Additionally, survey methodology does not capture the sender's ability to adjust or modify the message based upon feedback from the sender, as a public hearing does through questions and body language. Furthermore, these five moral foundations do not describe the full spectrum of human morality, as the potential inclusion of a sixth foundation illustrates. There are likely additional measures and moral framings that are employed and not measured by this model.

How people frame climate change in the moral sense could potentially impact preference and support for climate mitigation policy based upon a liberal or conservative spectrum. When speaking to legislators that ran on specific platforms, either Democratic or Republican, they will likely fall into the spectrum of liberal or conservative. This means by framing climate change in a more neutral or bipartisan way, supporters may be able to communicate more effectively with legislators. This could also be applied to the larger scale with regard to those who fall along a more general political spectrum.

However, this still cannot be considered a full measure of human moral foundations or individual differences.

In the context of this research, looking for framing that appeals to each moral foundation may reveal how moral framing is being presented, and if it potentially skews towards a certain political perspective. Knowing and understanding how people are framing climate change, and what specific moral foundations they appeal to, could help reveal better climate change communication methods. This means if, for example, the fairness/cheating foundation is focused on more strongly than the other four, then political liberals may be more responsive to the issue as opposed to a more bipartisan approach to discussing climate action. If this moral frame could shift to also discuss the foundations that political conservatives value in addition to fairness/cheating, such as sanctity/degradation, it may potentially help shift conservatives towards a more pro-environmental attitude.

Despite the ability of these moral foundations to establish a basic, if limited, understanding of the building blocks on which people create their moral frameworks and preferences, it is not a complete assessment of the nuances between specific people. For this work, a general liberal and conservative dichotomy is observed due the prior research regarding framing effects among political groups, which uses a similar method of analysis. This includes relying on liberal and conservative to describe large groups. When people self-identify along this spectrum, it also likely leads to differences among their specific concepts of moderate liberal, versus extreme liberal. Though there were spectrums used for this prior work, there is not a usable method for identifying similar spectrums in this research due to the challenges of the data and complexities of the

framing. These challenges illustrate the shortcomings of the Moral Foundations Theory model, but are embedded in the prior research used for the basis of this thesis.

III.IV.II Lakoff's "State as Family" Model

In his book *Moral Politics*, George Lakoff (2016) proposes that partisan differences in framing preference can be explained by different parental role frameworks, and that how an issue is traditionally framed through language will significantly impact support and understanding. He proposes this model as "State as Family," meaning that both liberals and conservatives see the state as reflecting a family structure. Where they differ however, is on what that family should look like. While conservatives have a traditional "Strict Father" framework, liberals have a less traditional "Nurturant Parent" framework. The Strict Father framework assumes people must have structure, discipline and punishment given to them by an authority figure, citizens and the state, respectively. In this framework, people are unable to function and learn without negative reinforcement from an authority figure. The liberal framework, the Nurturant Parent, assumes that people need to be guided and assisted by the parent figure. This means citizens are the responsibility of the state and the state must protect them. Lakoff offers that these frameworks influence support for legislation, such as welfare, based upon the preferences and worldview of the person. In the context of welfare, liberals may assert that you need to assist and uplift someone with financial support, while conservatives would see this as a handout (Lakoff, 2016).

Lakoff's theory was determined to be strongly empirically supported by Barker and Tinnick's (2006) research into ideological constraint, which found that parent

framework preferences are often predictive of political attitudes. This work found these frameworks were not predictive on affirmative action or environmental policy, something to consider in the context this research. These frameworks may not be as robust for work around environmental issues, something that has appeared throughout the literature regarding differing framing effects based upon political party. Despite this, Lakoff's (2016) framework is strong for explaining moral framing and political influences, making it useful for this work.

One criticism of Lakoff's (2016) work on traditional framing and partisanship appears in Djupe and Qwiasda's (2010) research into support for environmental policy changes by evangelical Christians with regard to decision making processes. According to Djupe and Qwiasda (2006), evangelical Christians will show stronger support for environmental attitudes if "they can assess the credibility of the opinion leader by seeing a trusted decision-making process" (p. 82). If the process, such as prayer or reflection, is known and trusted by the person presented the information by a group leader, it is more likely to change their opinion regarding the issue. Djupe and Gwiadsa (2010) use this information to challenge Lakoff's theory that framing can be easily used to influence American thought, instead proposing that while language matters, "the public can make meaningful use of simple substantive information when provided" (p. 83). While the point made by Djupe and Gwiadsa (2010) about the public not being so simple to influence is accurate, I would argue that Lakoff is not proposing that you can control people through traditional or moral frames. Lakoff (2010) writes:

Words themselves are not frames. But under the right conditions, words can be chosen to activate desired frames. This is what effective communicators do. In order to communicate a complex fact or a complex truth, one must choose one's words carefully to activate the right frames so that the truth can be understood. If

the hearer has no such frames, then you have to choose your words carefully to build up those frames...And if they make the mistake of thinking that words are frames, they will assume that all they need are the right words or slogans. (p.73)

This highlights confusion regarding traditional framing. While a frame might be “hospital,” as discussed in the framing definition section, that frame includes roles such as doctors, or objects such as medical equipment. While the frame hospital is a word, you can evoke the hospital frame without the word itself. Additionally, people already know what the hospital frame is, making it a usable frame. Djupe and Gwiasda (2010) appear to argue that Lakoff is proposing that a simple language shift can change a person’s mind. That is not what he proposes, why this research was structured to include more than simply traditional frames. Word or frame choice alone cannot completely encompass issue framing, it is only a piece of the puzzle.

Despite this support for Lakoff’s (2016) model, I do have some concerns regarding his work. As a criticism of Lakoff’s (2016) book *Moral Politics*, I would offer that he favors liberal thinking to a significant degree. His bias may influence his own assessment of the frameworks used by liberals and conservatives, lessening their impact or accuracy. While there was a study completed that supported his theory as discussed above, it is important to consider his personal bias about the issue. Explicit support for liberal thinking may skew his understanding of conservative thinking, potentially causing some limitations to his work. It is also critical to note that his bias impacts his assessment of the effectiveness of certain frame shifts, as he suggests in one of his publications, shifting from a “regulation” frame to a “protection” frame with regard to the environment (Lakoff, 2017). When considering Moral Foundations Theory and the liberal preferences for “harm/care” and “fairness/reciprocity,” this protection frame would certainly be

skewed towards an appeal to liberals as opposed to conservatives (Graham et al., 2009). Overall, I trust that Lakoff has some insight and a useful model, but his preference does complicate the issue somewhat. This research primarily relied on Moral Foundations Theory as an evaluative tool, but also considered and evaluated Lakoff's State as Family, merely with more restraint and reservation about the results.

Within *Moral Politics*, Lakoff (2016) proposes that many people have and operate with both moral frameworks, utilizing them at different times for different issues. When comparing the study completed by Benjamin et al. (2017) to the assentation by Lakoff (2016) that people have and use both parental frameworks to understand different issues, similarities emerge. To an extent this argument by Lakoff (2016) lines up with the study completed by Benjamin et al. (2017), who proposes that those who operate as independents or with unexpected views are more susceptible to framing effects. Lakoff (2016) proposes that reframing an argument in an attempt to influence those who have both parental frameworks, operating as swing voters, can help influence their decisions.

While I am not proposing influencing people to switch their political status, or manipulating them into a certain worldview, framing or reframing an argument to garner support is certainly an important aim when advocating for climate change mitigation policies. While it appears that the State as Family model (Lakoff, 2016) is not going to be an entirely complete assessment of how people understand and frame the world, appealing to people on a moral basis, or moral frame, has been studied by Wolsko et al. (2016). This work found that conservatives significantly shifted their support to be pro-environmental after exposure to a moral frame designed to appeal to political conservatives. This is significant for consideration with regard to the State as Family

model (Lakoff, 2016) and moral framing, and for this thesis. If a moral frame may potentially improve communication, it should be investigated to see what moral frames are being utilized within public hearings. The importance of a moral appeal is encompassed in the method of issue framing used for a topic such as climate change.

III.V Issue framing

Issue framing is the framing of an issue, such as climate change, for a precise, specific, and often political purpose. Since this work analyzed framing by climate change mitigation supporters who were speaking at public hearings, these speakers were constructing issue frames. When taken together, frames can illustrate the overall method of framing, while looking to science communication recommendations for additional rhetorical or argument strategy. Issue framing includes the construction of a specific framing of an issue by a speaker, articulating a message frame that is intended to specifically identify the core of that issue (Slothuus & de Vreese, 2010). Work from within several different areas will be discussed in this section, seaming together issue framing and science communication around climate change.

Lakoff (2010) argues that social movements that have been successful have also been successful in articulating clear and cohesive framings of the issues they represent. This includes movements such as the civil rights movement, union movement, and women's rights movement. In part, having a clearly articulated issue frame can be helpful for creating a movement that has a unified and clear message. Lakoff (2016) also asserts that the conservative right in The United States has historically been particularly effective in articulating issue frames, and that the more liberal left needs to create similarly

powerful and unified issue frames. Regardless of party affiliation, creating an issue frame that is clear and resonates with your audience may help improve communication efforts.

In part, this is related to reframing or rearticulating an issue.

Lakoff (2016) proposes and strongly advocates for the importance and strength of issue reframing. Issue reframing includes shifting the language of a discussion to your preferred traditional frame, such as climate change, as opposed to the less preferred frame global warming. Lakoff (2016) argues that using an opposing frame actually reinforces it, since it still evokes the background and understanding of that frame, even if you are saying no. This is where “don’t think of an elephant!” i.e., negating a frame, doesn’t work; it must be replaced with a new frame. Pralle (2006) touches on this issue within her work, proposing that if your preferred traditional frame and language is used within the conversation, it will strengthen your stance since you have more control. This is where reframing global warming into climate change is a proposed way to strengthen one’s stance. Outside of specific message frame shifts however, are audience considerations.

Know your audience. This has been highlighted in many forms throughout different works on different types of framing (Hulme, 2009; Lakoff, 2016; McCright et al., 2016; Shanahan, 2007; Villar & Krosnick, 2011; Wolsko et al., 2016). Throughout the literature, the importance of tailoring the frame to the respective audience has been repeatedly suggested and emphasized. This is arguably one of the most important considerations when understanding issue framing. Different audiences will hold different understandings and opinions about how the world is, and how it should be. This means that certain traditional and moral frames will not engage some audiences as well as

others. Despite the importance of knowing your audience, to what extent you can tailor your frame is highly contested.

What frames engage what political audience? This is touched on above regarding engagement of political parties and the use of moral frames, though not largely expanded on. I will now discuss these framing preferences and audience considerations in more detail.

Frames that engage Democrats and self-identified liberals may not engage Republicans and self-identified conservatives to the same extent, with differences in preference often being linked to partisanship due to moral or language preferences (Lakoff, 2016; Schuldt et al., 2011; Wolsko et al., 2016). Benjamin et al. (2017) proposed those who are not strongly partisan, such as independents, may be more strongly influenced by framing effects. This is not supported by Villar et al. (2010) who found independents are less vulnerable to traditional frame shifts of climate change versus global warming, with Republicans showing preference for climate change, similar to the finding by Schuldt et al. (2011) in which Republicans prefer the climate change frame. Villar et al. (2010) argue that framing will engage different people to different extents, making it challenging to fully implement language shifts that will effectively impact climate change preference or understanding. Depending on political party, language preferences appear in traditional and moral framing—areas encompassed within issue framing. However, other methods of improving scientific communication other than framing can be employed. The following section will explore the importance of communication skills other than simple framing.

III.VI Advocacy framing and communication

Work done on advocacy framing and climate change communication emphasizes the importance of several different issues, ranging from moral framing to word choice. This is where issue framing becomes significantly relevant, as it contains the intersection of traditional, message, and moral framing, alongside rhetorical strategies, and advocacy and communication recommendations.

One such issue is moral framing, which can be investigated through the models discussed above. Though in a more general sense, speaking to people about what matters to you and why it is connected to them can help build a personal connection and understanding. Science communication experts recommend trying to make an emotional connection with someone in order to help achieve this goal (Fahey, 2014b, 2014a; Lakoff, 2016; Porter, 2014; Somerville & Hassol, 2011). This includes using narrative to explain the issues and talking about how the listeners themselves will be directly impacted. This can be supported by speaking to a person's background, and connecting their background to your own (Hulme, 2009; McCright et al., 2016; Villar & Krosnick, 2011; Wolsko et al., 2016) Why does this matter to you, why should it matter to them, what is the emotional motivation or rationale? Aside from an emotional connection, good science communication also means speaking to people in a way they can clearly understand.

Recent reports recommend avoiding confusing jargon that people will not understand, as it can create barriers to communication (ecoAmerica, 2013; Fahey, 2014a; Lakoff, 2017). Lakoff (2017) proposes shifting language and word choice not only to avoid jargon, but to shift traditional frames. He uses the example of using the word

“protection” instead of “regulation,” since “regulation” is not only political jargon, but has a negative frame associated with it as being harmful to the economy. “Regulation” may also raise concerns among conservative minded people who prefer less government interference in the market. Additionally, the word “protection” is more understandable, allowing for the purpose of the regulation to be highlighted. Similar differences in word choice and jargon are illustrated in *Table 4. Scientific terms and public meaning*, reprinted from a report on effective climate change communication.

Table 4. Scientific Terms and Public Meaning. (Somerville & Hassol, 2011)

Terms that have different meanings for scientists and the public		
Scientific term	Public meaning	Better choice
enhance	improve	intensify, increase
aerosol	spray can	tiny atmospheric particle
positive trend	good trend	upward trend
positive feedback	good response, praise	vicious cycle, self-reinforcing cycle
theory	hunch, speculation	scientific understanding
uncertainty	ignorance	range
error	mistake, wrong, incorrect	difference from exact true number
bias	distortion, political motive	offset from an observation
sign	indication, astrological sign	plus or minus sign
values	ethics, monetary value	numbers, quantity
manipulation	illicit tampering	scientific data processing
scheme	devious plot	systematic plan
anomaly	abnormal occurrence	change from long-term average

Word choice here highlights issues of confusion around scientific jargon versus public understanding of those terms. While not directly related to framing, insofar as effective communication is concerned, word choice can confuse the meaning of a message and should be considered. If the words used cannot activate the intended frames, the thrust and strength of an argument could be lost. The structure of an argument is

another adjacent issue to framing, as illustrated in *Figure 1. Effective scientific argument structure*.

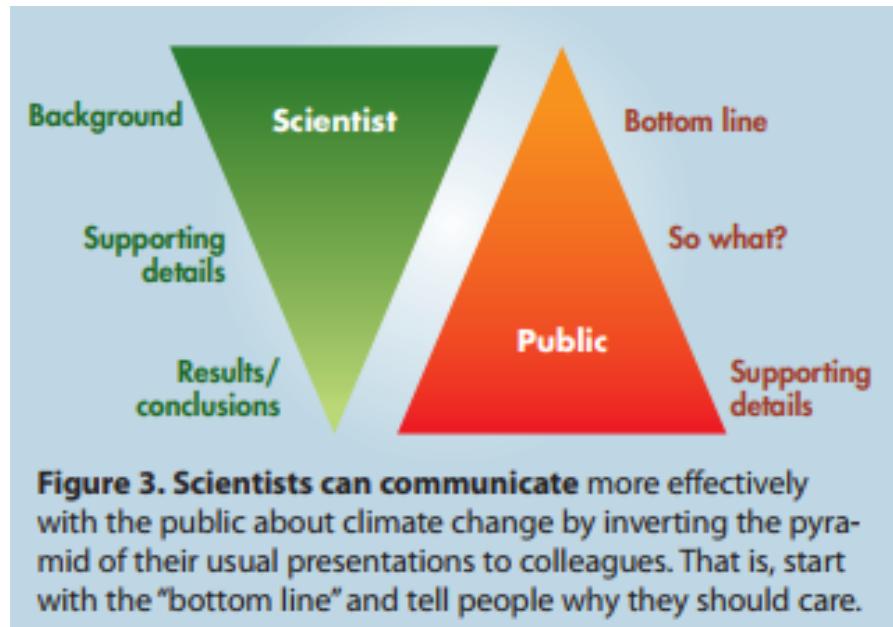


Figure 2. Effective Scientific Argument Structure. (Somerville & Hassol, 2011)

This figure, used by Somerville and Hassol (2011) in an article on effective climate change communication, proposes inverting the traditional scientific communication structure to establish significance prior to detailed explanation. This means telling the punchline at the start, allowing the listener to know what context they are operating within for the additional details. Again, this is relevant to framing since a cohesive structured argument will work to support the framing methods used by a speaker. There are many recommendations regarding effective climate change communication that intersect with different framing definitions. *Figure 2. Climate Messaging*, below, is a useful guide.

Users' Guide: Climate Messaging

- 1. Start with people, stay with people.** Say why it matters (to you *and* your audience). Connect with values—family, community, pride, working together for the common good.
- 2. Use facts wisely.** Talk *facts* not *science*. You lose people with jargon and too many numbers. One or 2 memorable facts from a trusted source are far more powerful.
- 3. Make it concrete.** Keep language vivid and familiar (*wind* and *solar*, not “alternative energy”). Start with personal (what we see at home) and scale up to the global.
- 4. Focus on solutions.** The problem is paralyzing. Inspire and empower with hope and opportunity. *Prepare*, don’t *adapt*. Talk about meaningful solutions

Figure 3. Climate Messaging. (Fahey, 2014b)

This guide is adapted by Anna Fahey (2014) from the “13 Steps and Guiding Principles” for climate change messaging by ecoAmerica (2013). Again, while not formally using framing, these methods of communication can support framing efforts by helping form a stronger argument overall. One recurring theme within communication literature emphasizes the importance of hope and avoiding fatalism (ecoAmerica, 2013; Fahey, 2014b; Shanahan, 2007). Fatalism paralyzes people, making them feel hopeless and stuck. Giving hope and offering solutions can help people feel like they have the power to mitigate the climate change crisis, something extraordinarily valuable in our current predicament

IV. Conclusion

Traditional, message, moral, and issue framing—all of these different methods of framing intersect in communication, advocacy, and rhetorical strategies, with dissent and disagreement about effects and recommendations. I will now review what has been discussed, highlighting where this thesis fits into the current understanding of framing.

The following research questions were selected for this thesis:

How has climate change been framed in practice over time, and how does this compare with recent scholarship on framing and science communication? This was broken into the following three sub questions: *How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?*

Prior research has focused on using survey methodology to establish framing effects among different groups, as opposed to framing in practice. This thesis builds upon prior work through the use of content analysis, in order to build a better understanding of frame use in practice. While framing effects are critical to study, knowing what frames are actually employed could help to ground research in practical application. If a frame is highly studied by rarely used, learning about a potential disconnect of research and reality is essential.

Traditional framing in the context of climate change has focused primarily on implicit frames or framing effects, such as preference for the frames climate change versus global warming. This work informed this research by looking for implicit frames

used within public hearings, as well as noting the use of climate change versus global warming frames. This will not utilize the survey methods found in the frame preference literature, looking more towards media framing as a methodological approach. There is currently no scholarship looking for these frames in practice in public testimony, making this research unique while remaining grounded in traditional framing literature. These frames will then be looked at in more detail, alongside +/- message framing as well.

Message (+/-) framing with regard to climate change has also focused on survey methods to observe preference for positive or negative frames. While the current scholarship does not show a strong connection between positive framing and support for climate change policy, the potential for overuse of positive framing, or the “Boomerang Effect” as proposed by de Vries (2017), does make this a piece that should be analyzed in public testimony. Whether or not balanced +/- message framing, highlighting both the positive and negative effects of policy, is occurring in public testimony on climate change is useful information to learn due to the potential backlash from the “Boomerang Effect” (de Vries, 2016). This leads into discussion on moral framing and political framing effects.

Political party affiliation has been shown to impact preference to some extent for traditional framing. In addition to this, party preference for different moral frames has been shown to have an effect on conservative environmental attitudes (Wolsko et al., 2016). While this research was also conducted using survey methodologies, I plan to utilize moral framing in this analysis of public testimony. This means looking at the traditional frames used, and seeing what moral frameworks they appeal to, based upon both Moral Foundations Theory (Graham et al., 2012, 2009) and Lakoff’s (2016) model

of State as Family. In regard to Moral Foundations Theory, by connecting the five moral foundations to specific frames used in the testimony, I will be able to investigate the occurrence of each one among different groups and over time. By doing so, the overall rates of occurrence and the differences among use for each group can be observed. In addition, understanding if the issue framing of climate change has changed over time can help investigate the overall tone, content, and accessibility of the argument. Though Moral Foundations Theory (Graham et al., 2012) is not the only model that will be used for moral framing within this thesis.

For Lakoff's (2016) State as Family, this means looking to see if they fit into the "Strict Father" or "Nurturant Parent" framework, conservative and liberal, respectively. This could add to the literature by looking to see if those speaking in support of climate change mitigation policy are basing their arguments in practice on one framework or the other, instead of speaking in theory or looking for preference based on survey responses. It may also reveal that they use both frameworks, or that the framing is not focusing on moral judgement. All of this information could be used to evaluate moral framing in practice. Issue framing, advocacy methods and recommended strategies either encompass or parallel these different forms of framing.

Recommendations from the related literature on climate change communication and advocacy relate strongly to different types of framing, since the structure and language can help support the framing efforts. Speaking to someone based upon moral judgements (moral framing), avoiding confusing jargon (traditional framing), and remaining hopeful as opposed to negative (+/- message framing), all relate to different aspects of the framing debate. Since these recommendations involve framing and are

made throughout climate change communication literature, it would seem that looking to see if those recommendations are being used in practice could help inform communication, about climate change communication. If the recommendations are not being implemented, it may be useful to conduct future research regarding if these messages are being received by the intended audience. Overall, this research fills in gaps in several different fields of work regarding different types of framing and communication in practice.

How we talk about an issue includes frames, traditional, message, and moral. Issue framing and climate change policy support efforts should be informed by the current science and recommendations within the literature, but we first must know how people are speaking in practice. If all of the recommendations, sciences and frames appearing in the current literature do not actually appear in practice, experts may be working on a body of literature that doesn't actually inform reality. Additionally, if these frames and recommendations are appearing in practice, knowing which ones and how they are used could also help inform what is being implemented, and what is not. If we want to work towards improving climate change framing and communication, we first must know how they are implemented in practice.

Chapter Three: Methods

I. Introduction

In the previous chapter, I reviewed the current literature on climate change framing and science communication efforts both generally and in relation to political affiliations. Previous research has focused on framing effects and surveys, as opposed to framing in practice. Due to this, the methods employed in this thesis do not utilize prior research approaches but do utilize them as background for the basis of the framework and code system. This is because the following questions require the investigation of framing used in practice at public hearings, as opposed to investigating the framing effects through a survey. These questions were selected to expand upon the current science communication and framing literature that was the basis of this work. Additionally, by answering these questions about framing in practice, potentially better advocacy and communication methods can be employed once there is a firm understanding of how climate change is discussed.

How has climate change been framed in practice over time, and how does this compare with recent scholarship on framing and science communication? This was broken into the following three sub questions: How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?

The frames found through this research were then evaluated against the established literature on framing and science communication, in order to determine similarities and differences. Frames were also evaluated over time and among specific selected categories, to see if there were changes in how testifiers articulated their arguments, and which frames they used.

For this thesis work, I used a qualitative approach to coding videos and audio recordings of public hearings on climate change related legislation at the Washington State Legislature from the 2007-2008 biennium, to 2017. Content analysis (Bernard et al., 2016) was used for establishing specific codes selected in the literature, such as the use of Moral Foundations Theory (Graham et al., 2012, 2009; Wolsko et al., 2016). After I completed the initial coding, I established more focused codes which were used to determine the overall themes and framing used by testifiers that fell outside of the prior research.

This section will first establish the sample selection methodology used for selecting public hearings for coding. Next, the speaker categories that were established to stratify the data will be defined and explained. Third, the methods used for organizing hearings by biennium is explained. Fourth, the coding process will be expanded upon, and finally, the coding analysis methods are defined.

II. Sample Selection

I found public hearings on bills using the Washington State Legislative search function of bill information on the website (<http://apps.leg.wa.gov/billinfo/>). By searching for all bills in and out of committee, I was able to determine bills that fit the

criteria of this thesis. The bills selected all included additional regulation on greenhouse gas emissions or climate change as opposed to loosening regulations.

Public hearings were selected for several reasons. First of all, public hearings are available online, making the data readily available. Second, there has not been work on how people articulate their arguments or framing in practice. This is also true at the Washington State Legislature specifically, despite the importance of the legislature in climate mitigation action. Third, those who speak at public hearings can come from a wide variety of backgrounds, from citizens to scientific experts. Public hearings were the only data used in order to evaluate speakers and frames in an “apples to apples” way. Spoken language is different than written language, and it would be more challenging to evaluate the two against each other. The inclusion of citizens also altered the ability to include written testimony. While the publications of a specific nonprofit or department may be evaluated against the speaker representing that group, the same is not true for citizens. Due to the diversity and limited information on audience segmentation within the citizen category, it would be unlikely to find publications to represent the different individuals accurately. Due to these challenges and the large amount of data captured within the sample size, only public hearings were selected.

I had several requirements for the bills I selected for analysis within this thesis. First, they must have been introduced between 2007-2017 in either the house or the senate. This is because some of the earliest work on climate change framing used was published in 2007 by Shanahan, while allowing for a larger sample size than establishing a date based upon later framing literature would have. Second, they must be explicitly related to climate change or greenhouse gas emissions regulations, supporting additional

regulations as opposed to removing or restricting regulations. Third, they must have had a public hearing in their chamber of origin, at which someone must have testified in support of the bill. Two bills initially selected were removed during the coding process due to a lack of supporters. Only one hearing per bill—the first hearing—was selected in order to represent a wider variety of bills in a larger time frame. During initial sample selection, all public hearings were to be included for each bill. After evaluating the timeframe for research and the less than graceful nature of coding videos, this was cut back to one hearing. The first hearing was also chosen since many bills only had one public hearing as opposed to multiple, so it reduced redundancy in speakers and framing. All selected hearings were bills, aside from one House Joint Memorial and two hearings on an initiative introduced in both the House and Senate. In total, 27 hearings were selected. Due to certain hearings occurring within the same session video, only 24 videos were used. This is because six hearings occurred at the same time as other bills in the same session, due to multiple bills being heard in the same council meeting. Two hearings, SB 5385 in the 2017-18 biennium, and SB 5237 in the 2007-08 biennium, were eliminated from this sample because nobody testified in support, leaving 25 hearings and 23 documents.

Selected and eliminated bill videos are listed below in *Table 5: Bills Initially Selected for Coding and Analysis*. Hearings were held in the; House Environment Committee; the Senate Energy, Environment and Telecommunications Committee; the Senate Environment, Water and Energy Committee; the House Ecology and Parks Committee; and the Senate Water, Energy and Telecommunications Committee. Several bills were companion bills to one another, though at times only one version of a bill

would get a public hearing. Due to this, and the potential for differences in the hearings, I kept companion bills from both bodies if they both had public hearings. The descriptions below are directly taken from the Washington State Legislative website. (“Bill Information,” 2018)

Table 5: Bills Initially Selected for Coding and Analysis

Biennium	Bill number	Committee	Summary	Additional information
2007-08	SB 6308	Water, Energy & Telecommunications	“Preparing for and adapting to climate change.”	Mp3 format
2007-08	SB 5237	Water, Energy & Telecommunications	“Regarding the purchase of carbon credits from methane-producing entities.”	Mp3 format. Eliminated, no supporters testified.
2007-08	SB 6001	Water, Energy & Telecommunications	“Mitigating the impacts of climate change.”	Mp3 format
2007-08	SB 6516	Water, Energy & Telecommunications	“Regarding greenhouse gases emissions and providing for green collar jobs.” Companion bill: HB 2815	Mp3 format
2007-08	HB 2815	Ecology & Parks	“Regarding greenhouse gases emissions and providing for green collar jobs.” Companion bill: SB 6516	Mp3 format
2009-10	SB 5735	Environment, Water & Energy	“Reducing greenhouse gas emissions.”	Companion Bill: HB 1819
2009-10	SB 5560	Environment, Water & Energy	“Regarding state agency climate leadership.”	
2009-10	SB 5989	Environment, Water & Energy	“Regarding the greenhouse gas emissions performance standard under chapter 80.80 RCW.”	Companion Bill: HB 2129

Bill				Additional information
Biennium	number	Committee	Summary	
2009-10	SB 5138	Environment, Water & Energy	"Creating an integrated climate change response strategy."	
2009-10	HB 2129	Ecology & Parks	"Regarding the greenhouse gas emissions performance standard under chapter 80.80 RCW."	Companion Bill: SB 5989
2009-10	HB 2772	Ecology & Parks	"Creating the climate change accountability act."	
2009-10	HB 1819	Ecology & Parks	"Reducing greenhouse gas emissions."	Companion Bill: SB 5735
2009-10	HB 1718	Ecology & Parks	"Reducing greenhouse gases in Washington."	Mp3 format
2011-12	SB 5509	Environment, Water & Energy	"Mitigating carbon dioxide emissions resulting from fossil-fueled electrical generation."	
2013-14	SB 5802	Energy, Environment and Telecommunications	"Developing recommendations to achieve the state's greenhouse gas emissions limits."	Companion Bill: HB 1915
2013-14	HB 2654	Environment	"Codifying the existence of the climate impacts group without making modifications to its current mission."	
2013-14	HB 1915	Environment	"Developing recommendations to achieve the state's greenhouse gas emissions limits."	Companion Bill: SB 5802
2015-16	SB 6306	Energy, Environment and Telecommunications	"Creating a fossil fuel carbon pollution tax."	

Bill				Additional information
Biennium	number	Committee	Summary	
2015-16	SI-732	Energy, Environment and Telecommunications	"Creating a carbon pollution tax on fossil fuels to fund a reduction in the state sales tax, a reduction in the business and occupation tax on manufacturing, and the implementation/enhancement of the working families' sales tax exemption."	Companion bill: HI-732
2015-16	HI-732	Environment	"Creating a carbon pollution tax on fossil fuels to fund a reduction in the state sales tax, a reduction in the business and occupation tax on manufacturing, and the implementation/enhancement of the working families' sales tax exemption."	Companion bill: SI-732
2015-16	HB 1314	Environment	"Implementing a carbon pollution market program to reduce greenhouse gas emissions."	Companion Bill: SB 5283 (not selected due to lack of public hearing)
2015-16	HJM 4009	Environment	"Requesting action to address global climate change."	
2015-16	HB 1487	Environment	"Reducing emissions by making changes to the clean car standards and clean car program."	Companion Bill: SB 5423 (not selected due to lack of public hearing)
2017-	SB 5385	Energy, Environment and Telecommunications	"Creating a fossil fuel carbon pollution tax."	(Eliminated, no supporters testified)

Bill			Additional information
Biennium	number	Committee	
2017-	HB 1144	Environment	"Amending state greenhouse gas emission limits for consistency with the most recent assessment of climate change science."
2017-	HB 1646	Environment	"Promoting an equitable clean energy economy by creating a carbon tax that allows investment in clean energy, clean air, healthy forests, and Washington's communities." Companion Bill: SB 5509 (not selected due to lack 2017 public hearing)
2017-	HB 1372	Environment	"Updating the framework for reducing greenhouse gas emissions in Washington based upon best available climate science."

Using the Washington States' Public Affairs Network (TVW) website I downloaded all of the videos or mp3 files for the bills. The majority of the documents were video (mp4) format but five documents were in audio only (mp3) format. The different format of the videos versus the mp3 files may have introduced some minor differences in the coding and analysis, since it is more challenging to observe who is speaking in audio recordings. When I contacted TVW, they told me they did not cover all hearings with video before 2008, which is why there was the difference in formatting. Despite this, covering a larger span of time was critical enough to include the files, even with the format differences and challenges therein.

III. Categories

The categories in *Table 6: Categories of Speakers* represent the seven different codes used to designate general groups. These were derived from the initial coding process, which included a more detailed form of coding based on the group a person belonged to. Those codes were used to determine more general groups, in order to see if there is an observable change over time in who is speaking at public hearings. Code co-occurrence tables for each frame and speaker category were used to see if there were differences in how each group framed its argument. This analysis looked at changes over time, in addition to general trends among groups.

Table 6: Categories of Speakers

Category	Definition
Citizen	A speaker representing him or herself.
Community group	If the speaker is representing a community group, such as faith groups, community organizations, etc.
Elected official	If the speaker belongs to the Washington State Legislature, local governments, etc. The speaker is an elected official or representing the view of an elected official.
Governmental agency /public institution	If the speaker is a representative of a government agency or institution, such as the Department of Ecology, local PUD, educational institution, etc.
NGO/nonprofit	If the speaker is a representative of a nonprofit organization, such as advocacy groups, environmental groups, or similarly designated nonprofits.
Private company	If the speaker is a representative of a private company or business, such as private construction groups, private utilities, etc.
Union	If the speaker represents a specific union.

IV. Time

Time was a significant factor in the organization of this thesis work. Videos were arranged and grouped into their respective biennium. This was to allow analysis by group

in Atlas.ti, which permitted the investigation into changes over time. This included looking for changes in the categories of speakers through the use of co-occurrence tables, in order to control for large frame shifts due to changes in participation. Additionally, this gave an idea of how framing has changed in the past ten years, what frames have become less popular, and which have increased in their use. This is particularly relevant for research into framing in practice, so the most recent understanding of framing can be acquired. If time was not identified as a variable in this work, frames that have fallen out of favor but were highly used previously may have skewed the results.

V. Coding

Videos were then imported into Atlas.ti and coded using its content analysis function (Bernard et al., 2016). Coding and content analysis were selected since this specific research has not been conducted previously, so there are not defined methods from other work, but coding is a commonly used social science method for determining themes. Prior work on framing focuses mostly on surveys and frame preferences, as opposed to analyzing frames in action. Due to the differences between this work and the established literature, their methods were not utilized since a survey would be an inappropriate way to interrogate the data. Specific frames and models, such as Moral Foundations Theory (Graham et al., 2012, 2009), were employed in the coding process however, in order to implement the Content Analysis methodology.

Content Analysis was selected to inspect if the frames discussed in the literature appeared within the testimony. The initial coding, although not line by line as with text, looked for and coded specific phrases and words used by the speakers. This was intended to maintain the speaker's original frame as completely as possible. These codes were then

used to determine categories and themes within the hearings, as frames from the literature were then applied to the existing quotations. Comments were used to define focused codes throughout the work, in order to maintain consistency. Codes were both selected from the literature, and coded based upon the language used by the speaker. This was intended to look for occurrences of the frames from the framing literature, and potentially differing frames used by speakers that were not explicitly in the literature.

Only those explicitly testifying in support of a bill, or those testifying in support but asking for amendments, were included in the coding. This is because the research questions specifically look for those who are speaking in support of climate change mitigation. Those who did not support the bills were not included since this was not captured in the research question. This does pose some challenges since there may be people who support climate change mitigation but do not support a specific bill, and this may disallow more nuanced opinions. Despite this, the most definite way to determine if the speaker supports climate change mitigation was to select only explicit supporters of bills, instead of attempting to decide if a person supports climate change mitigation without additional information.

If a person testified in support of multiple bills in a biennium, only their chronologically earliest testimony in the biennium was included. This was to reduce redundancies in the coding and analysis, so certain phrases or discussion were not overrepresented. Selecting their testimony chronologically allowed a methodology for selecting the order in which to code the hearings. It also often allowed capture of the most complete testimony offered by the speaker. Often speakers would make a point to discuss that they had testified to the same body on a similar issue previously, and would

not like to reiterate their entire argument again. By selecting the first testimony of the biennium, it reduced redundancies while capturing more of the speaker's argument.

Coding included generating codes in Atlas.ti based upon the specific language used by those speaking, such as the inclusion of the terms climate change or global warming, discussion of climate science, or if they were discussing benefits or negative impacts. This allowed for themes in framing and language to be determined based on what language was used, and how. These codes were used to determine traditional, message, and moral frames. The code groups generated included general frames (traditional), climate change versus global warming (traditional), +/- message framing, Moral Foundations Theory (moral), and Lakoff's State as Family (moral).

The density of these codes and their rate of occurrence was not controlled for any additional factors. The frames that were coded were specifically from the speaker themselves, and were not adjusted for issues such as repetition of the bill language itself, or popular media terms. The speakers in selected hearings did not have a standardized amount of time to speak, so certain people would have two minutes while others would have thirty. This gave more time for an argument and issue frame to appear for the longer articulations, and potentially the overrepresentation of their framing. Additionally, there was not a standard number of supporters for each bill or biennium, potentially altering the frame representations within each year. To adjust for this, specific years with too few supporters were not analyzed individually, but were included in the total overall.

VI. Coding Analysis

Traditional frames were basic frames such as the use of terms like climate change versus global warming (Benjamin et al., 2017; Schuldt et al., 2011; Villar & Krosnick, 2011). Message (+/-) frames are positive or negative framing (Gifford & Comeau, 2011), in this case if they were speaking about the negative impacts of climate change or the potential positive impacts from passing the bill. Moral frames were evaluated based upon Moral Foundations Theory (Graham et al., 2012, 2009; Wolsko et al., 2016) and Lakoff's (2016) State as Family model. Additional evaluation based upon science communication recommendations, such as the avoidance of jargon (ecoAmerica, 2013; Fahey, 2014a; Lakoff, 2010) or attempting to connect with your audience based on a moral or emotional basis (Hulme, 2009; McCright et al., 2016; Villar & Krosnick, 2011; Wolsko et al., 2016) was included. These frames and science communication methods were evaluated to look for trends in how supporters frame their argument and if there was a prevailing method of issue framing. *Figure 4. Coding Analysis Framework*, below, is a schematic of the framework used for coding analysis.

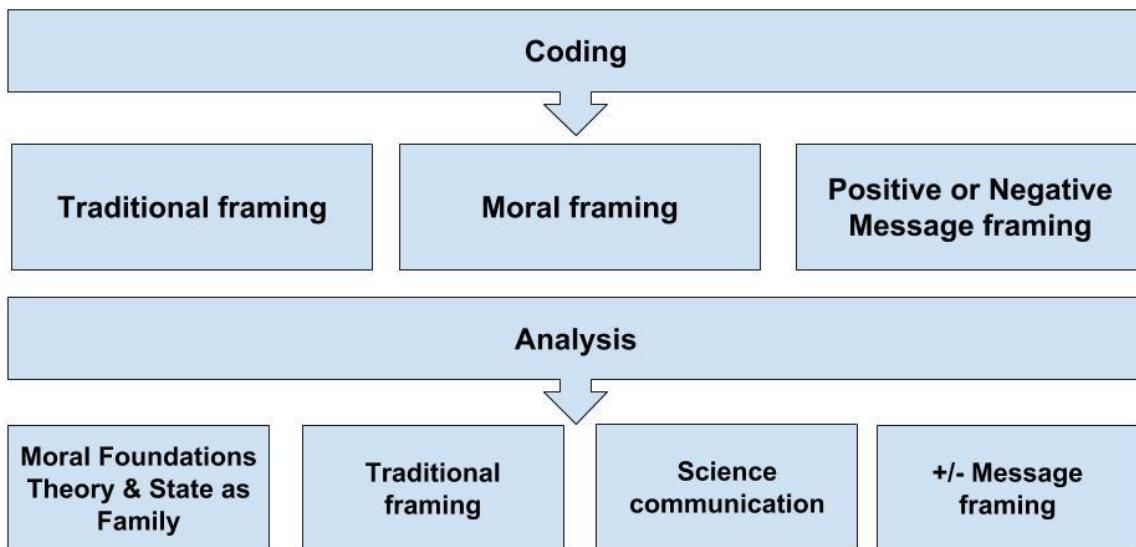


Figure 4. Coding Analysis Framework.

These different frames and communication methods were evaluated together to determine if there were trends in the method of issue framing employed by speakers. This is because by definition, issue frames include all framing an issue that is articulated and selected by a speaker, in this case a climate change mitigation supporter. These frames were analyzed to look for changes in framing over time, such as shifting from a climate change frame to a global warming frame, or if the +/- message frame becomes more or less positive. Moral frames may have changed or evolved in their partisanship, such as shifting to or from a more bipartisan framing method based upon Moral Foundations Theory (Graham et al., 2012, 2009; Wolsko et al., 2016) or State as Family (Lakoff, 2011), or remaining the same. While there are challenges inherent in selecting political parties or dichotomies for analysis, it was still employed based upon prior research and context of the public hearings themselves.

While looking towards the preferences for each moral foundation, and the framing within public hearings on climate change policy, this dichotomy will be a useful

classification and discussion piece, but is not intended to explain the specific nuances that will occur on the individual level. It is also not intended as a prescriptive or final answer to dealing with partisanship and moral framing, only a way to discuss and describe the types of moral frames that appear when people are arguing in support of climate change mitigation. When looking at diverse groups of people in specific classifications, there are assumptions made that will not clearly apply to all individuals. Despite this, due to the ability to classify moral frames through Moral Foundations Theory, and the simplicity of a liberal/conservative classification system, it was still selected as a way to characterize the discussion throughout this work.

VII. Conclusion

Through the use of content analysis I investigated the frames articulated by climate change mitigation supporters in Washington State legislative public hearings over a 10-year time period, from 2007-2017. This permitted the careful interrogation of framing in practice, while remaining grounded and informed by the previously established literature. Additionally, this allowed for the analysis of the results to compare real world advocacy in practice, to the recommended methods from science communication and framing literature. By comparing the two and carefully analyzing the uses, not only can a body of work on framing in reality be established, but advocacy methods can be appropriately informed by practice versus principle.

By selecting content analysis, I was able to employ findings from previous framing and science communication literature within my coding and analysis. Previous work frequently used approaches that would not be appropriate to answer the research question proposed within this work, since it looks at framing in practice as opposed to

frame preference. Survey methods employed in prior research are useful for determining preferences among groups, but not for finding out how those groups discuss or frame an issue. Due to the nature of this research question, the use of content analysis appropriately informs this work to expand on the established literature without departing from it entirely. The next section will relay the findings and results from these methods.

Chapter Four: Results

I. Introduction

The previous chapter laid out the methods selected for this thesis research, including the use of content analysis (Bernard et al., 2016) and coding in Atlas.ti. Additionally, the data organization and stratification methods were expanded on, such as the group category selections, and bill biennium formatting, to answer questions regarding framing differences over time, and among different speaker categories.

In order to establish the results from this study, the following section provides the outcome of coding different frames within the videos, including traditional, message, and moral frames. Issue frames were not coded, since the three frame types selected are all representations of issue framing by the speakers, as they attempt to achieve a targeted purpose through their articulations. Each frame will be defined, use over time will be discussed, in addition to the overall framing without the consideration of time. The density over time will be broken up among frame groups, in order to illustrate the differences among these groups. Code co-occurrence tables were generated and will be explored to establish trends among group categories. Code co-occurrence tables, which show how many times specific codes track alongside one another, were used to look for co-occurrences of specific codes and speakers. These will be discussed in their own respective sections, in order to maintain organization.

To begin, the density of speaker categories over time will be discussed. This was completed in order to establish differences in group participation across a given biennium. By doing so, the interpretation of these results was informed by the potential

for changes over time by investigating potential frame shifts based on a difference in participation. Next, traditional frame results will be established, both over time and their co-occurrence tables. This includes basic frames developed through the initial coding, and frames selected for coding from the literature. Next, +/- message frames will be discussed. These specific +/- message frames were selected from the literature on climate change +/- message framing, and the influence of a positive versus a negative message. Finally, moral framing results will be presented through the use of Moral Foundations Theory (Graham et al., 2012) and the State as Family model (Lakoff, 2016). Each set of frames and codes will have quotes provided as examples and context. After establishing the results, I will transition to the discussion of these results and their significance.

II. Speaker Category Code Density

The distribution for the speaker category codes follow, showing the overall distribution of participation over the selected 10-year period.

1. **NGO/nonprofit** (30.13%)
2. **Citizen** (19.25%)
3. **Governmental agency/public institution** (15.90%)
4. **Private company** (12.97%)
5. **Community group** (10.88%)
6. **Elected official** (8.37%)
7. **Union** (2.51%)

Table 7: Category Density shows the percentage of speakers who belonged to each group per biennium. The speaker categories within each biennium changed over

time. Due to the small sample sizes of each year, there are some results that appear significantly skewed, such as 2011-2012 for *private company*. When you look to the far right of the table, you can see there were only two speakers that biennium (and only one hearing), so it makes a large difference in the overall percentage. Due to issues of sample size in 2011-12 and 2013-14, they are included in the overall total but will not be discussed specifically. This is due to the skew of the data caused by the small sample size. The bottom row shows the total percentage of each code over the past ten years.

Table 7: Citizen and Community Group Participation Rates

Biennium	Citizen	Rate	Community Group	Rate	All Speakers
2007-2008	4	8.33%	6	12.50%	48
2009-2010	10	17.86%	6	10.71%	56
2011-2012	0	0.00%	0	0.00%	2
2013-2014	1	6.25%	1	6.25%	16
2015-2016	18	29.03%	6	9.68%	62
2017	13	23.64%	7	12.73%	55
Totals	46	19.25%	26	10.88%	239

Citizen – This is the second-largest group overall (19.25%), which has gone up in 2017 (23.64%), when compared to 2007 (8.33%).

Community group – This is the fifth-largest group overall (10.88%) which has remained fairly consistent in 2017 (12.73%) compared to 2007-08 (12.50%).

Table 8: Elected Official and Governmental Agency/Public Institution Participation Rates

Biennium	Elected Official	Rate	Governmental Agency /Public Institution		Rate	All Speakers
2007-2008	6	12.50%	13		27.08%	48
2009-2010	7	12.50%	13		23.21%	56
2011-2012	0	0.00%	0		0.00%	2
2013-2014	1	6.25%	4		25.00%	16
2015-2016	4	6.45%	3		4.84%	62
2017	2	3.64%	5		9.09%	55
Totals	20	8.37%	38		15.90%	239

Elected official – The sixth-largest group (8.37%) with an overall decrease in 2017 (3.64%) compared to 2007-08 (12.50%).

Governmental agency/public institution – This is the third-largest group overall (15.90%). This group has gone down in 2017 (9.09%), with an overall decrease in participation compared to 2007-08 (27.08%).

Table 9: NGO/Nonprofit, Private Company, and Union Participation Rates

Biennium	NGO/Nonprofit	Rate	Private Company			Union	Rate	All Speakers
2007-2008	10	20.83%	8	16.67%	1	2.08%	48	
2009-2010	10	17.86%	10	17.86%	0	0.00%	56	
2011-2012	0	0.00%	2	100.00%	0	0.00%	2	
2013-2014	5	31.25%	4	25.00%	0	0.00%	16	
2015-2016	22	35.48%	6	9.68%	3	4.84%	62	
2017	25	45.45%	1	1.82%	2	3.64%	55	
Totals	72	30.13%	31	12.97%	6	2.51%	239	

NGO/nonprofit – This is the largest overall group (30.13%) This group has gone up in percentage attendance in 2017 (45.45%) when compared to 2007 (20.83%).

Private company – This is the fourth-largest group (12.97%) with a decrease in speakers in 2017 (1.82%) from 2007-08 (16.67%).

Union – This is the smallest overall group (2.51%) and has seen an increase from 2007-08 (2.08%) to 2017 (3.64%).

III. Traditional Frames

III.I. General frames

The distribution for the general frame codes follow, showing the overall distribution of occurrence over the selected 10-year period.

1. **Economy/money** (64.02%)
2. **Science** (50.21%)
3. **Washington State** (50.21%)
4. **Environment** (35.15%)
5. **Future generations/children** (27.62%)
6. **Leadership** (25.52%)
7. **Risk/disaster** (19.67%)
8. **Responsibility/accountability** (16.74%)
9. **Equity/equality** (15.90%)

This section will define and provide the results for the general traditional frames, both over time and their co-occurrence tables. The codes found in *Table 10: General Frame Definitions* were generated after initial coding, and influenced by Shanahan's

frames. They were created based on the density of the codes created during initial coding, and put into categories similar to Shanahan's if appropriate, or placed into their own if needed. This allowed for a comparison to the literature, and the generation of new codes if needed.

Table 10: General Frame Definitions

Code	Definition
Economy/money	If the speaker discusses issues of the costs of climate change, economic benefits, clean energy economy, state revenue options, etc. The discussion of climate change in the context of money.
Environment	If the speaker discusses impacts on the environment or ecology of the planet. This includes animals, outdoor recreation, the risk to our natural world, importance of protecting the planet, etc.
Equity/equality	If the speaker discusses issues of equity and equality in climate change, who is impacted, the importance of protection, etc.
Future generations /children	If the speaker discusses the impacts of climate change on children or future generations.
Leadership	If the speaker discusses climate change leadership, asking for leadership, Washington as a leader, legislators as leaders. etc.
Responsibility /accountability	If the speaker discusses taking responsibility for climate change, having accountability in climate policy, responsibility to protect legal rights around climate change, etc.
Risk/disaster	If the speaker discusses the risks of climate change, possible negative impacts, natural disasters, etc.
Science	If the speaker discusses climate science, specifically or generally. This includes discussion of emissions/greenhouse gases, acceptable levels, reality of climate change/agreement among scientists, the use of scientific language, etc.
Washington State	If the speaker discusses climate change and Washington State, Washington as part of a larger community, nationally or worldwide, Washington's unique climate vulnerability, etc.

The codes that mirror Shanahan's are risk/disaster to catastrophe, economy/money to money, and equity/equality to justice and equity. The environment frame is similar but more overarching than the polar bear frame. The remaining frames

did not have similarities to Shanahan's frames, and were therefore only determined based on the language in the hearings.

III.I.I. General frame density

Due to issues of sample size in 2011-12 and 2013-14, they are included in the total but will not be discussed specifically. *Table 11: General Frame Density*, provides a breakdown numerically and as a percentage of speakers for the economy/money and environment frames.

Table 11: General Frame Density One: Economy/Money and Environment

Biennium	Economy/Money	Rate	Environment	Rate	All Speakers
2007-2008	26	54.17%	17	35.42%	48
2009-2010	33	58.93%	14	25.00%	56
2011-2012	1	50.00%	0	0.00%	2
2013-2014	10	62.50%	9	56.25%	16
2015-2016	57	91.94%	26	41.94%	62
2017	26	47.27%	18	32.73%	55
Totals	153	64.02%	84	35.15%	239

Economy/money – This frame has the highest overall occurrence rate (64.02%), with a decrease from 2007-08 (54.17%) to 2017 (47.27%).

These quotes allude to or directly discuss economic and monetary concepts and considerations in the context of climate change. Cost, economy, markets, and low carbon economies were persistent trends throughout the economic framing of climate change.

*“....help make Washington State a global leader in the **low carbon economy** of the future” HB 1646 Washington State Budget and Policy Center (emphasis added).*

*“....you apply a tax to the pollution you don’t want, and **the market** will find the most **cost effective** way to reduce it” SI-732 Carbon WA (emphasis added).*

*“...we need to address major environmental and **economic challenges**.....that create large numbers of sustainable **living wage jobs**” HB 1819 Sound Alliance (emphasis added).*

Environment – This frame comes in fourth overall (35.15%), with a decrease from 2007-08 (35.42%) to 2017 (32.73%). This frame has remained fairly steady across the years.

The environment framing was fairly common, and the quotes below illustrate specific examples from supporters. Discussion of specific environmental impacts or factors, landscape and place, the outdoors, and species were only some of the methods for characterizing and framing climate change.

*“We are **drawn to the outside**, our outdoor activities make us one of the country’s healthiest states, **our access to water, mountains, grasslands**, makes Washington an attractive place for business people seeking a higher quality of life, **and in the outdoors***

"we feel more attuned to and responsible for the environment's health" HB 1314 REI
(emphasis added).

"...we would urge the governor and the work group when speaking about effects to Puget Sound, to focus on our native aquatic species..." HB 1915 Coalition to Protect Puget Sound Habitat (emphasis added).

Table 12: General Frame Density Two: Equity/Equality and Future Generations/Children

Biennium	Equity/Equality	Rate	Future Generations /Children	Rate	All speakers
2007-2008	1	2.08%	7	14.58%	48
2009-2010	5	8.93%	8	14.29%	56
2011-2012	0	0.00%	0	0.00%	2
2013-2014	1	6.25%	6	37.50%	16
2015-2016	13	20.97%	17	27.42%	62
2017	18	32.73%	28	50.91%	55
Totals	38	15.90%	66	27.62%	239

Table 12: General Frame Density Two includes the traditional frames equity/equality and future generations/children. These frames are broken down numerically, by percentage of speaker, and in total.

Equity/equality – While this frame is 9th and occurs the least frequently overall (15.90%), it has seen the second most dramatic rate increase (30.65%) from 2007-08 (2.08%) to 2017 (32.73%). Proportionately, this has seen the highest increase overall between 2007-08 and 2017.

The equity/equality frame frequently discussed specific impacts on vulnerable populations, and the unique challenges that face people of color and low-income people due to climate change. The quotes below are examples of the specific language and arguments used within this framing, which has become increasingly common in recent years.

“...low-income people, and people of color are more likely to experience any of the negative health problems that we have from any of our issues here in Washington, but particularly CO₂ emissions. One thing that you can look to communities of color and low-income communities to see that we are actually the canaries in the coal mine. What that means is we are the ones who get hit first by poor environmental regulations and policies” Puget Sound Sage HB 1646 (emphasis added).

“Polluters paying, or contributing to offset the cause of their pollution is the fairest way to go. We think this is an equitable revenue source to fund critical needs...” HB 1314 Washington Conservation Voters (emphasis added).

Future generations/children - This frame is fifth overall (27.62%), with an overall increase from 2007-08 (14.57%) to 2017 (50.91%). This frame has the largest increase (36.33%) between 2007-08 and 2017.

The quotes below are from specific children and young adults testifying in support of climate change mitigation. These supporters commonly discussed their lack of

power, and the significant challenges they would face in the near future due to an issue they did not create.

“...what you do affects not just me, but possibly every person in my generation who lives in Washington State....if laws like this don’t get passed, Seattle might be under water by 2050, when I’ll just be 43 years old...” HB 1372 Plant for the Planet (emphasis added).

“....posing a threat to everyone, especially my generation ...it’s violating my constitutional right to a clean and livable future, and to breathable air, and drinkable water. It’s just the wrong way to go” HB 1372 Plant for the Planet (emphasis added).

“....I am seven years old, and I live next to a park in Seattle, and I see a lot of wildlife like harbor seals and pups, and if we do not stop global warming then the sea level will become higher and higher and the seals might lose their resting spot. How can we stop global warming, a problem kids did not create?” HB 1915 Cool Mom (emphasis added).

Table 13: General Frame Density Three includes the traditional frames leadership and responsibility/accountability. These frames are broken down numerically, by percentage of speaker, and in total.

Table 13: General Frame Density Three: Leadership and Responsibility/Accountability

Biennium	Leadership	Rate	Responsibility /Accountability	Rate	All Speakers
2007-2008	16	33.33%	2	4.17%	48
2009-2010	14	25.00%	7	12.50%	56
2011-2012	0	0.00%	1	50.00%	2
2013-2014	3	18.75%	3	18.75%	16
2015-2016	12	19.35%	11	17.74%	62
2017	16	29.09%	16	29.09%	55
Totals	61	25.52%	40	16.74%	239

Leadership – This frame is sixth overall (25.52%). There was a drop from 2007-08 (33.33%) and 2017 (29.09%). The 2013-14 biennium (18.75%) has a small sample size compared to other years (16 speakers), but 2015-16 saw a similar decrease (19.35%).

The quotes below are examples of this specific frame, relating to the importance of leadership on climate change. Often speakers discussed Washington State itself or the legislators themselves as climate change leaders.

*“...positioning Washington as a **leader**...” SB 6001 Washington Environmental Council (emphasis added).*

*“I’m ending with **asking you to be climate champions**, we voted (for) **you to be climate champions**” HB 1372 Plant for the Planet (emphasis added).*

*“...this is about **leadership**, this is about looking beyond tomorrow and looking to next year, and to looking to 2011. You have shown great leadership on this issue, the*

*governor has worked with you to **make us a leader**, let's stay there, **let's not lose that leadership position***" SB 5735 Department of Ecology (emphasis added).

Responsibility/accountability – This frame is eighth overall (16.74%). There has been an increase from 2007-08 (4.17%) to 2017 (29.09%).

Below are specific examples of quotes that illustrate instances of the responsibility/accountability frame. Interestingly, speakers would often discuss responsibility in different ways. Either as there being no specific group to blame, or that certain groups were innocent.

*"...no one has meant for this to happen, and what I mean by that is **there is no individual or agency, organization, that is really responsible** for us to having to look squarely at such a difficult problem, and yet here we are"* HB 1144 University of Washington (emphasis added).

*"....as well as paying attention to workers in carbon dependent industries, **they didn't cause the problem**, but they have incomes, healthcare benefits, and pensions that we need to protect"* HB 1314 Washington State Labor Council (emphasis added).

*"...this means that the building sector absolutely has a **responsibility** to understand and work to mitigate our collective carbon impact....looking at carbon **accountability** in*

Washington is really a yesterday issue, but today will do ” HB 1314 Skanska (emphasis added).

Table 14: General Frame Density Four includes the traditional frames risk/disaster, science, and Washington State. These frames are broken down numerically, by percentage of speaker, and in total.

Table 14: General Frame Density Four: Risk/Disaster, Science, and Washington State

Biennium	Risk/Disaster	Rate	Science	Rate	Washington State	Rate	All Speakers
2007-2008	11	22.92%	20	41.67%	27	56.25%	48
2009-2010	7	12.50%	28	50.00%	19	33.93%	56
2011-2012	0	0.00%	1	50.00%	0	0.00%	2
2013-2014	5	31.25%	12	75.00%	13	81.25%	16
2015-2016	7	11.29%	30	48.39%	35	56.45%	62
2017	17	30.91%	29	52.73%	26	47.27%	55
Totals	47	19.67%	120	50.21%	120	50.21%	239

Risk/disaster – This frame is seventh overall (19.67%). There has been an increase from 2007-2008 (22.92%) and 2017 (30.91%). This frame has had variation across years but no distinct upward or downward trend.

The risk/disaster frame quotes below are examples of the ways this frame was articulated. This frame was often discussed in both the abstract and concrete disasters that will occur from climate change, either specific types of storms and natural disasters, or more vague impacts.

“...our next generation’s future is in danger...” HB 1372 Plant for the Planet (emphasis added).

“...interestingly enough, in today’s times, there’s an article about changes in Kansas, harshest droughts to hit the great plains in a century, freakish snowstorms and suffocating gales of dust....” HB 1372 Citizen (emphasis added).

“We have to understand that we are a part, and absolutely indivisible from the environment, and what we do to it, we shape it as it shapes us. The effects we have on it will in turn come back to us, and we right now are practicing self-destruction” HB 2815 Citizen (emphasis added).

Science – This frame is tied with Washington State at overall rate of occurrence (50.21%). It has an increase in occurrence in 2017 (52.73%) compared to 2007-08 (41.67%).

The science frame quotes below represent the methods with which speakers discussed and articulated the frame. Through the discussion of specific results and scientific language, speakers used scientific evidence to make their case.

“...in the 2013 report, based on science through about 2012, so we’ve got 4 years of science beyond the latest report, it said it is “extremely likely,” as you said, more than 95%, that more than half of the observed increase in global average temperature is

caused by manmade increase in greenhouse gases” HB 1144 University of Washington (emphasis added).

“....has provided a fundamental scientific understanding, projections, models, and technical expertise needed to help state and local decision makers assess and manage risks of climate variability and change” HB 2654 Climate Impacts Group (emphasis added).

Washington State – This frame is tied with science at rate of occurrence (50.21%). It occurred at a lower rate in 2017 (47.27%) compared with 2007-2008 (56.25%).

Washington State was a very common frame used in the public hearings by many different speakers. Washington was often articulated in relation to other frames, and was used to describe both the people, economy, location, and environment of the state, among other things. Below are specific examples of quotes from supporters speaking at the hearings.

*“Represents an importance piece, of an importance effort, to move **the state** towards an energy mix that minimizes carbon emissions....”* HB 1314 EDF Renewable Energy (emphasis added).

*“I believe we in **Washington** ought to be optimistic about our ability to whip climate change”* SB 5802 Washington State Governor Inslee (emphasis added).

“...I’m a fourth generation Washingtonian, grew up right by the border, I have seven nieces and nephews that are growing up here...” HB 1819 Citizen (emphasis added).

III.I.II. General frame co-occurrence

Table 15: General Frame Co-Occurrence represents where specific frames intersect with speaker categories. There is not a standardized representation of each group; the sample sizes for the speaker categories are different among the groups.

Table 15: General Frame Co-Occurrence

Code	Citizen	Community Group	Elected Official	Governmental Agency/			Private Company	Union
				Public Institution	NGO /Nonprofit			
Economy /Money	36	15	11	18	38	23	5	
Environment	11	10	7	12	29	4	2	
Equity /Equality	4	7	2	4	18	1	3	
Future generations /Children	15	6	3	2	31	3	1	
Leadership	9	4	5	11	22	5	1	
Responsibility /Accountability	3	5	5	4	13	3	4	
Risk/Disaster	8	2	6	6	19	1	0	
Science	21	11	11	18	38	12	1	
Washington State	16	13	13	12	43	13	1	

Citizen – Used the economy/money (36) frame the most overall, followed by science (21), then Washington State (13).

Community group – Used the economy/money (15) frame the most overall, followed by Washington State (13), then science (11).

Elected official – Used the Washington State (13) frame the most, followed by a tie between science (11) and economy/money (11).

Governmental agency/public institution – A tie between economy/money (18) and science (18), followed by a tie between environment (12) and Washington State (12).

NGO/nonprofit – Used Washington State the most overall (43), followed by a tie between economy/money (38) and science (38).

Private company – Used economy/money (23) the most, followed by Washington State (13), then science (12).

Union – Used economy/money (5) the most, followed by responsibility/accountability (4), then equity/equality (3).

III.II. Climate change versus global warming frames

The distribution for the climate change and global warming codes follow, showing the overall distribution of occurrence over the selected 10-year period.

1. **Climate change** (48.12%)
2. **Global warming** (10.88%)

These codes were selected before initial coding based upon the literature on frame preference for climate change over global warming. The time factor is intended to look for changing frames. This was also coded due to the shift in frame preference over time, as the framing effect has lessened. Finding out if this frame is used less could be informative with regard to the framing effect, since there would be less exposure.

Table 16: Climate Change versus Global Warming Definitions includes the definitions of the traditional frames climate change and global warming. These frames were selected from the prior research on framing effects.

Table 16: Climate Change versus Global Warming Definitions

Code	Definition
Climate change	If the speaker explicitly uses the "climate change" frame when speaking.
Global warming	If the speaker explicitly uses the "global warming" frame when speaking.

These frames had to be explicitly stated within the hearings, by the speaker saying “climate change” or “global warming.” This was to reduce confusion regarding them referring to the same phenomenon. A speaker who discussed climate change without explicitly using the term would not have been coded. Although this does not necessarily

capture all instances of the frame use, it was to prevent confusion between the specific frames. Those that used both the climate change and global warming frame were coded as such, so one speaker could have both frames individually coded on their testimony. In particular, this was due to the terms being used interchangeably by certain speakers without changing tone. Since the speakers were specifically supporting climate change mitigation, they did not use the global warming frame in a particularly alarmist or denialist way, though the code was still applied. In part, this is because the message frame itself may contain the global warming term but be representing in a different manner by the speaker, and can be perceived differently by the receiver. (Interestingly, although outside of the scope of this work, those who spoke in opposition to mitigation at times did use global warming in a denialist and alarmist way.)

III.II.I. Climate change versus global warming density

Due to issues of small sample size causing skew in 2011-12 and 2013-14, they are included in the total but will not be discussed specifically. *Table 17: Climate Change versus Global Warming Density* includes the traditional frames climate change and global warming. These frames are broken down numerically, by percentage of speaker, and in total.

Table 17: Climate Change versus Global Warming Density

Biennium	Climate Change	Rate	Global Warming	Rate	All Speakers
2007-2008	18	37.50%	8	16.67%	48
2009-2010	24	42.86%	9	16.07%	56
2011-2012	0	0.00%	0	0.00%	2
2013-2014	7	43.75%	3	18.75%	16
2015-2016	32	51.61%	4	6.45%	62
2017	34	61.82%	2	3.64%	55
Totals	115	48.12%	26	10.88%	239

Climate change – This frame appeared at a higher rate overall (48.12%) than global warming. This frame has increased in rate of use from 2007-08 (37.50%) to 2017 (61.82%).

The quotes below illustrate specific instances of the use of the climate change frame, which was increasingly popular among all groups over time.

*“Absolutely, the governor believes that we should lead on **climate change**....”* SB 5560 Washington State Governor’s Office (emphasis added).

*“Looking at the impacts of **climate change**....”* SB 6308 Puget Sound Clean Air Agency (emphasis added).

*“...strong scientific consensus that **climate change** must be aggressively addressed...”* HB 1819 King County (emphasis added).

Global warming – This frame appeared at a lower overall rate (10.88%) than climate change. This frame has decreased in use from 2007-08 (16.67%) to 2017 (3.64%).

Below are specific instances of the global warming frame. Interestingly, although this frame decreased in popularity when it was used it was often in conjunction with the climate change frame.

*“...that enough is known about **global warming**... HB 2815 Alcoa (emphasis added).*

*“...practical and profitable solutions to **global warming**... ” SB 5802 Climate Solutions (emphasis added).*

*“...first when I heard about **global warming** it was like, well, that’s about 100 years off, you know, I’ll be long compost by then... ” HB 2815 House representative (emphasis added).*

III.II.II. Climate change versus global warming co-occurrence

Table 18: Climate Change versus Global Warming Co-Occurrence shows the intersections of the frames with each categorical group.

Table 18: Climate Change versus Global Warming Co-Occurrence

Code	Citizen	Community Group	Elected Official	Governmental Agency /Public Institution		NGO /Nonprofit	Private Company	Union
				Agency	/Public Institution			
Climate change	14	12	11	18		39	7	5
Global warming	5	4	3	1		9	2	0

This code co-occurrence table shows differences in the climate change versus global warming frames used by each speaker group. There is not a standardized representation of each group; the sample sizes for the speakers are different among the groups.

Citizen – This group used the climate change (14) frame more than global warming (5).

Community group - This group used the climate change (12) frame more than global warming (4).

Elected official - This group used the climate change (11) frame more than global warming (3).

Governmental agency/public institution - This group used the climate change (18) frame more than global warming (1).

NGO/nonprofit - This group used the climate change (39) frame more than global warming (9).

Private company - This group used the climate change (7) frame more than global warming (2).

Union - This group used the climate change (5) frame more than global warming (0).

IV. Positive and Negative Message Framing

The distribution for the +/- message codes follow, showing the overall distribution of occurrence over the selected 10-year period.

1. **Positive message framing** (53.14%)
2. **Negative message framing** (46.86%)

Message (+/-) framing codes were used to highlight messages that reflect either the benefits of legislation, or the negative impacts from not passing climate change mitigation bills. This was used to look for how speakers frame the issue to the legislators, by discussing benefits or negative impacts.

Table 19: +/- Message Framing Definitions contains the definitions of the negative message framing and positive message framing codes. These codes were selected from the prior research on framing effects with relation to the message tone.

Table 19: +/- Message Framing Definitions

Code	Definition
Negative message framing	If speaker uses negative message frames to discuss climate change or the bills. This includes negative impacts from not passing the bills, the need for sacrifices, the potential for loss, etc.
Positive message framing	If speaker uses positive message frames to discuss climate change or the bills. This includes positive impacts from passage, including economic benefits, benefits to community, positive environmental impacts, etc.

IV.I. +/- Message framing density

Due to issues of small sample size causing skew in 2011-12 and 2013-14, they are included in the total but will not be discussed specifically.

Table 20: +/- Message Framing Density includes the +/- message frames negative message framing and positive message framing. These frames are broken down numerically, by percentage of speaker, and in total.

Table 20: +/- Message Framing Density

Biennium	Negative Message Framing	Rate	Positive Message Framing	Rate	All Speakers
2007-2008	15	31.25%	24	50.00%	48
2009-2010	23	41.07%	31	55.36%	56
2011-2012	0	0.00%	2	100.00%	2
2013-2014	8	50.00%	10	62.50%	16
2015-2016	26	41.94%	37	59.68%	62
2017	40	72.73%	23	41.82%	55
Totals	112	46.86%	127	53.14%	239

Negative message framing – This frame appeared at a lower overall rate (46.86%) than positive message framing (53.14%). This frame saw an increase from 2007-08 (31.25%) to 2017 (72.73%).

Below are specific example quotes of the +/- message frames used by speakers at the hearings. Negative message frames were often used to highlight the negative impacts of potentially unmitigated climate change on people and the environment.

*“We are **putting our economy at risk** if we don’t transition to renewable energy...” HB 1372 Citizen (emphasis added).*

*“...climate change represents **one of the most significant threats to human health** we have ever faced, and that **threat is no longer future, we are facing real health consequences now**. Changes in crop production, water shortages, infectious diseases, and air pollution are **just some of the issues** that we’ll face globally as well as here in our state” HB 1314 American Lung Association (emphasis added).*

*“...so what are the **consequences** going to be if we allow, **on the worst end**, an additional eight-degree change over the coming 50 to 100 years? My stance is that it is **completely unethical for us to find out**...” SB 6001 Ikemeyer and Associates Climate Action Fund (emphasis added).*

Positive message framing – This frame appeared at a higher overall rate (53.14%) than negative message framing (53.14%). It saw a decrease from 2007-08 (50.00%) to 2017 (41.82%).

Specific quote examples of positive message frames are below, which often focused on the economic and business case for climate change mitigation.

“I believe that green jobs is a tremendous opportunity for our nation and really a tremendous opportunity for our state ...” HB 2815 Citizen (emphasis added).

“Our company is a really great example of how doing good things for the environment is also doing good things for business” HB 2815 McKinstry Company (emphasis added).

“...trying to bring forward something that will actually give some accountability to the efforts we are making in this state....” HB 2772 House Representative (emphasis added).

IV.I.I +/- Message framing co-occurrence

Table 21: +/- Message Framing Co-Occurrence shows differences in positive and negative message framing used by each categorical group. There is not a standardized representation of each group; as the sample sizes for each category are different among the groups.

Table 21: +/- Message Framing Co-Occurrence

Code	Citizen	Community Group	Elected Official	Governmental			Private Company	Union
				Agency /Public Institution	NGO /Nonprofit			
Negative message framing	29	9	7	11	42	3	4	
Positive message framing	20	15	9	18	36	21	3	

Citizen – This group used negative message framing (29) more than positive message framing (20).

Community group - This group used negative message framing (7) less than positive message framing (9).

Elected official - This group used negative message framing (9) less than positive message framing (15).

Governmental agency/public institution - This group used negative message framing (11) less than positive message framing (18).

NGO/nonprofit - This group used negative message framing (42) more than positive message framing (36).

Private company - This group used negative message framing (3) less than positive message framing (21).

Union - This group used negative message framing (4) more than positive message framing (3).

V. Moral Framing

This section focuses on the results found through the use of Moral Foundations Theory (Graham et al., 2012) and Lakoff's (2016) State as Family model. These sections will look at framing over time and co-occurrence tables for categorical groups among both models. Results will begin with Moral Foundations Theory, then move on to State as Family.

V.I. Moral Foundations Theory

The distribution for the Moral Foundations Theory codes follow, showing the overall distribution of occurrence over the selected 10-year period.

1. **Care/harm** (59.00%)
2. **Authority/subversion** (46.44%)
3. **Fairness/cheating** (39.75%)
4. **Loyalty/betrayal** (25.94%)
5. **Sanctity/degradation** (4.60%)

Moral Foundations Theory codes were generated based upon the five moral foundations (Graham et al., 2012, 2009; Wolsko et al., 2016). *Table 22: Moral Foundations Theory Definitions* includes the definitions for each code.

Table 22: Moral Foundations Theory Definitions

Code	Definition
Authority/subversion	This code refers to one of five moral foundations, the authority/subversion foundation. This foundation relies on the importance of leadership and deferring to authority.
Care/harm	This code refers to one of five moral foundations, the care/harm foundation. This foundation relies on empathy and the aversion to the pain of others.
Fairness/cheating	This code refers to one of five moral foundations, the fairness/cheating foundation. This foundation relies on the assumption that people should be treated equally and not allowed to cheat.
Loyalty/betrayal	This code refers to one of five moral foundations, the loyalty/betrayal foundation. This foundation highlights self-sacrifice and the importance of groups. It is associated with patriotism.
Sanctity/degradation	This code refers to one of five moral foundations, the sanctity/degradation foundation. This foundation relies on disgust and cleanliness, and the importance of preserving what is pure. It is associated with religious purity.

V.I.I. Moral Foundations Theory density

Due to issues of small sample size causing skew in 2011-12 and 2013-14, they are included in the total but will not be discussed specifically. *Table 23: Moral Foundations Theory Density* includes the moral frames authority/subversion, and care/harm. These frames are broken down numerically, by percentage of speaker, and in total.

Table 23: Moral Foundations Theory Density One: Authority/Subversion and Care/Harm

Biennium	Authority /Subversion	Rate	Care /Harm	Rate	All Speakers
2007-2008	31	64.58%	24	50.00%	48
2009-2010	31	55.36%	26	46.43%	56
2011-2012	2	100.00%	0	0.00%	2
2013-2014	7	43.75%	10	62.50%	16
2015-2016	19	30.65%	38	61.29%	62
2017	21	38.18%	43	78.18%	55
Totals	111	46.44%	141	59.00%	239

Authority/subversion – This frame appeared at the second highest overall rate (46.44%).

It decreased in occurrence from 2007-08 (64.58%) to 2017 (38.18%).

The authority/subversion moral foundation framing quotes below illustrate specific examples by testifying supporters. These quotes discuss the importance of leadership, and hierarchical follow-through in relation to the Paris Agreement.

“The Legislature has the opportunity to live up to the promise of the Paris Agreement by making Washington a leader in the United States” HB 1372 Unitarian Universalist (emphasis added).

“There are great examples in our state of businesses leading the way...” HI-732 Carbon Washington (emphasis added).

“...we think the roles of the various players in the workforce system are well laid out, well recognized, so they can make a significant contribution to this major initiative” HB 2815 Workforce Board (emphasis added).

Care/harm – This frame appeared at the highest overall rate (59.00%). It increased from 2007-08 (50.00%) to 2017 (78.18%).

Care/harm moral foundation example quotes below illuminate the methods for which testifiers articulated these frames. Even explicitly, speakers link the role of legislators as those of caretakers.

“This is not a political issue, this is a moral issue. It goes back to the basic morals of taking care of your children, me, and making sure we are going to have a stable future” HB 1372 Plant for the Planet (emphasis added).

“We believe climate change is a social and racial justice issue, because again, as Rich said, it is low-income people, racial minorities, that are most impacted by the impacts of pollution and climate change....in many low-income neighborhoods where there are lots of people of color, almost every single kid has an asthma inhaler....” HB 1314 Asian and Pacific Islander Coalition of Washington State (emphasis added).

Table 24: Moral Foundations Theory Density Two includes the moral frames fairness/cheating, loyalty/betrayal, and sanctity/degradation. These frames are broken down numerically, by percentage of speaker, and in total.

Table 24: Moral Foundations Theory Density Two: Fairness/Cheating, Loyalty/Betrayal, and Sanctity/Degradation

Biennium	Fairness /Cheating	Rate	Loyalty /Betrayal	Rate	Sanctity /Degradation	Rate	All Speakers
2007-2008	8	16.67%	16	33.33%	3	6.25%	48
2009-2010	11	19.64%	8	14.29%	2	3.57%	56
2011-2012	0	0.00%	0	0.00%	0	0.00%	2
2013-2014	8	50.00%	5	31.25%	1	6.25%	16
2015-2016	33	53.23%	24	38.71%	2	3.23%	62
2017	35	63.64%	9	16.36%	3	5.45%	55
Totals	95	39.75%	62	25.94%	11	4.60%	239

Fairness/cheating – This frame appeared at the third highest rate overall (39.75%). It increased from 2007-08 (16.67%) to 2017 (63.64%).

The fairness/cheating foundation was often discussed in the context of equity, equality, and social justice, as shown by the quotes below. Speakers framed climate change as an issue that does not impact groups in a fair way, often causing the most harm to already vulnerable populations.

“...projections didn’t really show any evidence that things are going to get better or easier for communities of color. Resources will continue to be consolidated in the hands of the few, and I don’t know that people have a lot of time when they are trying to put food on the table to prepare for what’s to come down the pipe. This is a direct quote from... “when climate change impacts everyone, not everyone will be impacted equally.

Existing social, economic, and health disparities mean that people of color and low-income people are both more likely to be affected by and have a harder time adapting to new climate realities” HB 1646 Got Green (emphasis added).

“It is true that climate change affects everyone, but it does not affect everyone equally” HB 1314 WashingtonCAN (emphasis added).

“I just wanted to speak up for those who can’t be here, our grandchildren, and those who are coming after us....think about our grandchildren” HB 1819 Citizen (emphasis added).

Loyalty/betrayal – This frame appeared at the fourth highest overall rate (25.94%). It decreased from 2007-08 (33.33%) to 2017 (16.36%). There is not a consistent drop however, shifting among 2009-10 (14.29%) and 2015-16(38.71%).

As shown by the quotes below, speakers often discussed the loyalty/betrayal foundation in the context of Washington State behaving well towards other states and the people. Legislators were also called upon to act as loyal representatives of those who elected them.

“....help ensure Washington does its fair share to help address climate change...” HB 1144 Department of Ecology (emphasis added).

“...it is extremely important that Washington join in the international effort to begin curtailing greenhouse gases...” SB 6001 Senator (emphasis added).

“We the people signed this initiative, and we the people elected you to represent us and our wishes....” SI-732 Citizen (emphasis added).

Sanctity/degradation – This frame appeared at the lowest overall rate (4.60%). It decreased from 2007-08 (6.25%) to 2017 (5.45%). This frame had little change overall, remaining consistently low.

The quotes below are examples of the sanctity/degradation foundation. Speakers often discussed stewardship and religion in the context of climate change, and the importance of preserving our pristine planet.

“...for me as a person of faith, the care of creation and the protection of Earth, and the life support systems on Planet Earth from the devastating effects of global warming are not just environmental and economic issues, fundamentally at their core they are moral and ethical issues and the responsibility of everyone” HB 1819 Sisters of the Holy Names of Jesus and Mary (emphasis added).

“There is a growing religious consensus that climate change is one the most important moral issues of our time, if not the most important moral issue. We believe that people of faith are called to care for all of creation, which means the protection of both people’s

health and the health of all creatures on the planet” SB 6001 Earth Ministry (emphasis added).

V.I.II. Moral Foundations Theory co-occurrence

Table 25: Moral Foundations Theory Co-Occurrence shows differences in Moral Foundations Theory codes between categorical groups. There is not a standardized representation of each group; the sample sizes for the categories are different among the groups.

Table 25: Moral Foundations Theory Co-Occurrence

Code	Citizen	Community Group	Elected Official	Governmental Agency /Public Institution	NGO /Nonprofit	Private Company	Union
Authority /subversion	13	11	11	22	28	15	2
Care/harm	22	17	8	21	53	5	6
Fairness /cheating	19	11	3	8	42	3	4
Loyalty /betrayal	11	8	4	7	21	8	1
Sanctity /degradation	0	5	1	0	3	1	0

Citizen – This group used care/harm (22) the most, followed by fairness/cheating (19), then authority/subversion (13).

Community group - This group used care/harm (17) the most, followed by a tie between fairness/cheating (11) and authority/subversion (11).

Elected official - This group used authority/subversion (11) the most, followed by care/harm (8), then loyalty/betrayal (4).

Governmental agency/public institution - This group used authority/subversion (22) the most, followed by care/harm (21), then fairness/cheating (8).

NGO/nonprofit – This group used care/harm (53) the most, followed by fairness/cheating (42), then authority/subversion (21).

Private company - This group used authority/subversion (15) the most, followed by loyalty/betrayal (8), then care/harm (5).

Union - This group used care/harm (6) the most, followed by fairness/cheating (4), then authority/subversion (2).

V.II. State as Family

The distribution for the State as Family codes follow, showing the overall distribution of occurrence over the selected 10-year period.

1. **Nurturant** (51.05%)
2. **Strict** (17.99%)

Table 26: State as Family Definitions contains the codes and definitions of Lakoff's (2016) State as Family model. Each reflects the different 'parent' style discussed in *Moral Politics*.

Table 26: State as Family Definitions

Code	Definition
Nurturant	If the speaker uses the "nurturant parent" framing based upon Lakoff's model.
Strict	If the speaker uses the "strict father" framing based upon Lakoff's model.

V.III. State as Family density

Due to issues of small sample size causing skew in 2011-12 and 2013-14, they are included in the total but will not be discussed specifically. *Table 27: State as Family Density* includes the moral frames nurturant and strict. These frames are broken down numerically, by percentage of speaker, and in total.

Table 27: State as Family Density

Biennium	Nurturant	Rate	Strict	Rate	All Speakers
2007-2008	19	39.58%	15	31.25%	48
2009-2010	23	41.07%	10	17.86%	56
2011-2012	0	0.00%	0	0.00%	2
2013-2014	10	62.50%	1	6.25%	16
2015-2016	31	50.00%	9	14.52%	62
2017	39	70.91%	8	14.55%	55
Totals	122	51.05%	43	17.99%	239

Nurturant – This frame appeared at a higher overall rate (51.05%) than strict (17.99%).

It increased from 2007-08 (39.58%) to 2017 (51.05%).

The quotes below were selected to highlight instances of the nurturant framing defined in Lakoff's (2016) State as Family model. They often focused on the importance

of caring for those in need, protecting the environment, and science. In order for the nurturant frame to be coded, it had to include multiple aspects of the framing.

*“....the number one issue that is affecting not only this state, but **the planet**, and the number one issue on the minds of concerned citizens who **care about our air, our land, our water, and our people**” HB 2815 Washington Conservation Voters (emphasis added).*

*“I hear about things like **tundra and the ocean ice melting at rates that nobody could have foreseen**, and what I think, man I really can’t have kids right now, **the future is too uncertain and I’m scared**...and I feel like it’s the **only natural response to all of the data and evidence in front of us right now**...” SB 5802 Citizen (emphasis added).*

Strict – This frame appeared at a lower overall rate (17.99%) than nurturant (51.05%). It decreased from 2007-08 (31.25%) to 2017 (14.55%).

The quotes selected below highlight instances of strict framing as defined by Lakoff’s (2016) State as Family model. This framing often included emphasis on economic and capitalist benefits, efficiency, and religion.

*“...as opposed to having government pick and choose what clean energy projects to support, I-732 is a **market-based solution that will let consumers choose**...” SI-732 Citizen (emphasis added).*

*“....I’m going to focus on our main interest which is **consumer choice**demonstrating strong consumer interest, but their choices are limited...” HB 1487 Western Washington Clean Cities (emphasis added).*

“One of the guiding principles of the Quaker faith is stewardship, we are called upon to manage our time, abilities and possessions wisely and efficiently....” HB 1646 Quaker Voice on Washington Public Policy (emphasis added).

V.II.I. State as Family co-occurrence

Table 28: State as Family Co-Occurrence contains the intersections of categorical groups and State as Family codes. There is not a standardized representation of each categorical group; the sample sizes for the categories are different among the groups.

Table 28: State as Family Co-Occurrence

Code	Citizen	Community Group	Elected Official	Governmental			Private Company	Union
				Agency /Public Institution	NGO /Nonprofit			
Nurturant	22	12	8	12	51		3	6
Strict	9	8	4	3	6		8	2

Citizen – This group used nurturant (22) more than strict (9).

Community group - This group used nurturant (12) more than strict (8).

Elected official - This group used nurturant (8) more than strict (4).

Governmental agency/public institution - This group used nurturant (12) more than strict (3).

NGO/nonprofit – This group used nurturant (51) more than strict (6).

Private company - This group used strict (8) more than nurturant (3).

Union - This group used nurturant (6) more than strict (2).

VI. Conclusion

The selected public hearings on climate change mitigation were revealed to have a significant breadth of framing used among all the speaker group categories. While previous work has focused on framing effects, this investigation has revealed framing in practice among climate change supporters. All groups, including citizen, NGO/nonprofit, community group, private company, elected official, union, and governmental agency/public institution used a different mix of frames, and had a different participation rate over time.

The citizen (19.25%) and NGO/nonprofit (30.13%) group had the highest overall rates of attendance, increasing over time. Due to the high rate of participation from these groups, the frames they favored for use tended to be the most popular. This includes frames such as economy/money (64.02%) and care/harm (59.00%).

Among all frames there were changes in use from 2007-2017 both overall and among all categories of speakers. Several of these frames thematically mirror or relate to one another, such as fairness/cheating and equity/equality, care/harm, future generations/children, and nurturant. Similarly, the frames authority/subversion, loyalty/betrayal, strict, and leadership reflect similar information and values. The following section will expand on the analysis of each frame specifically, in relation to other frames, and among the different speaker categories.

Chapter Five: Discussion

I. Introduction

In the previous chapter, results from coding were provided in the form of code densities and co-occurrence tables. Each specific frame was discussed in relation to the changes over time and overall rate of occurrence, in addition to categorical considerations. Specific quotes were provided to add context and examples of each frame. These data were provided to help answer the following research questions:

How has climate change been framed in practice over time, and how does this compare with recent scholarship on framing and science communication? This was broken into the following three sub questions: *How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?* This chapter will expand on the results to analyze each specific frame in relation to these questions.

Climate change moral framing has become increasingly liberal and less conservative overall, with an increase in care/harm, fairness/cheating, future generations/children, and nurturant frames. There has been a decrease in conservative framing, specifically strict, leadership, loyalty/betrayal, and authority/subversion. These frame changes may partially be explained by changes in speaker categories overall, with increased citizen and NGO/nonprofit participation, and a decrease in participation among the private company, elected official, and governmental agency/public institution groups.

In part, by only analyzing testimony from supporters this analysis likely captures a crowd of speakers that may be more likely to fall into the political liberal side of the spectrum. This might be a factor for the framing that leans towards a liberal perspective, as opposed to more bipartisan or conservative framing. If the testimony from those who opposed or were neutral on the bills was coded, there may have been a wider spectrum of framing used. Even so, the increase in liberal framing among strictly climate change supporters is still an interesting shift, and an important one considering the potential value of bipartisan framing.

This chapter discusses the differences and specifics for each frame type and code, then moves on to discuss the more general trends over time in issue framing and the science communication implications. Differences over time among speaker categories will be explored throughout and used in interpretation.

II. Traditional Frames

This section will focus on discussion of specific traditional frames, both general frames and the climate change versus global warming frames. The results from this research will be expanded on in relation to the previous literature on climate change framing.

II.I. General frames

Several of the frames that appeared within the hearings were similar to Shanahan's (2007), as discussed above (risk/disaster/catastrophe,

economy/money/money, and equity/equality/justice and equity). One frame, environment, was similar but included more than simply the “polar bear” frame of Shanahan’s. He discussed the polar bear frame as appealing to those who love animals and wildlife, which is very similar to the environment frame, which appeals to those who care for the natural world in a more general sense. The remaining frames, future generations/children, leadership, responsibility/accountability, science, and Washington State were determined based only upon the language and arguments used by speakers in the hearings. Shanahan’s (2007) frames were not empirically determined, and instead thematically discussed in the context of media frames. This work is able to determine frames similar to those Shanahan discussed in his work, while determining additional frames and contrasting the content/context of the framing. Because this work has not been done before, I was looking for some sort of guidance on frames without directly using frames that have not been researched. I will first discuss the frames that mirror Shanahan, then the one that is similar and, finally, the different frames.

Economy/money – This frame appears at the highest overall rate, but decreases from 2007-08 to 2017. The appearance of this frame in legislative hearings is unsurprising, particularly due to the content of many of the bills heard. For example, I-732, heard in both the House and Senate, is a carbon tax and relies heavily on economic considerations and data. Similar carbon tax or cap and trade bills had economic elements, which were discussed at length. Shanahan (2007) attested that this framing would engage an audience comprised of politicians or policymakers. Based on that consideration, and the logic of forming an argument around economic costs or benefits, this framing has some

potentially significant utility. Also, while the specific audience supporters were speaking to during the recording of the legislative videos was the legislators, they are not the only audience either in that room or for the videos. There is an audience behind the speaker comprised of both supporters and those in opposition, in addition to those who may not have a specific position yet. Convincing this audience, and those who will watch legislative videos later on, is also critical. Additionally, as testimony is used for additional purposes, such as news publications, the framing will likely reach a larger audience than strictly the few people within the room or those watching the original legislative videos.

According to several authors and researchers (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016), an argument needs to engage people on a moral and emotional level. Due to this, a strictly economic discussion is unlikely to sway an audience. However, it was not uncommon for speakers to thread the needle of economic considerations with moral implications, such as the economic hardship families could face from climate change, or the United States performing as an economic leader in clean energy. While one of the frames that became attached to these supporters' testimony was economy/money, that frame itself is not totally representative of their argument. In part, this was addressed by additional moral frames being used in the coding process, though this does not completely capture or represent the complexity of the framing or issue. The economy/money frame addresses only a single, subject-related frame within climate change. Additionally, Lakoff (2016) argues that the economy is a moral concern for many Americans, not only a practical one. Even among Western thought and in the United States in particular, efficiency, money, and the

economy are closely tied with commonplace principles about being hardworking and diligent. So, while based on the specific way the economy/money frame has been articulated for this work, it doesn't necessarily fit as a moral argument, in practice it is very closely tied with many issues that transcend this specific frame definition.

Equity/equality – Despite being the lowest overall occurring frame, this frame has seen the largest proportionate rise in occurrence between 2007-08. This is a significant frame shift, going from nearly unused in 2007-08 to roughly one third of speakers discussing it in 2017. This frame did appear in Shanahan's (2007) work, discussing its usefulness for people with ethical concerns. This method of discussing and framing environmental issues and climate change has become increasingly popular in both culture and academia as well, likely being mirrored and reflected into political hearings and discussion as well. Similarly, insofar as engaging an audience morally (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016), this frame has strong moral implications and mirrors the moral frame fairness/cheating (Graham et al., 2012, 2009). The partisan and moral framing implications will be discussed below, in the fairness/cheating section.

Risk/disaster – This frame comes in seventh overall for rate of occurrence, though there has been an increase between 2007-2008 and 2017. Despite variation across years, there has not been a distinct trend upwards or downwards. Shanahan (2007) proposes that this frame may engage an audience that is concerned about future events. While there were speakers who discussed impacts on the future, and their significant concern for these

impacts, they often intersected these concerns with overwhelmingly negative message framing. While climate change and negative impacts tend to go hand-in-hand, framing the issue by discussing risks or disasters may be less advisable than benefits (Gifford & Comeau, 2011). Even so, there are significant risks and literal disasters associated with climate change, to both society and the environment. While focusing on an overwhelmingly negative, risk-based framing may not be completely effective, focusing strictly on the benefits of passing legislation could create suspicion or distrust based upon the boomerang effect (de Vries, 2016). Outside of the specific research regarding disaster framing, Flottum (2017) argues that climate cannot be interacted with, and that weather is the closest representation. Based upon this assessment, by discussing specific weather-related impacts, a supporter may be able to craft a clearer understanding of the impacts of climate change and reduce the abstraction of this issue.

Environment – This frame is fourth overall in rate of occurrence, with a slight decrease from 2007-08 to 2017. Despite this, the environment frame has remained fairly steady in rate of occurrence across the years. This frame is similar to the Polar bear frame proposed by Shanahan (2007), though it was expanded to cover more information. While the Polar bear frame discusses impacts on wildlife, and uses a charismatic animal, the environment frame includes a broader discussion. This includes the discussion of impacts on ecosystems, or less charismatic creatures such as shellfish. While the Polar bear frame Shanahan (2007) discusses may appear in media, the discussion in public hearings is far broader. Despite this, these two frames parallel one another fairly well, and incorporate moral considerations (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016). With that said, this frame may run into challenges due to a

lack of interest in the biological or ecological considerations of environmental issues. This frame relies on the listener to care about things such as biodiversity, ecosystems, or spending time outdoors. If there is not a great concern among the audience about these issues, it may be less effective. Focusing on the potential impacts or benefits for humans, as opposed to the environment, may be a more effective method of discussing climate change.

Future generations/children – This frame was fifth for overall occurrence, and had the largest percent increase compared to all other traditional general frames. One unique contributor to this increase was possibly due to the increase in citizen and NGO/nonprofit participation, as many of the speakers from those groups were children in more recent hearings. These children would talk about their fear for the future, the responsibility of the legislature to protect them and their rights, and asked for action that would help their generation. They also discussed the implications of putting the burden of previous generation's mistakes on future generations, who didn't cause the problem but would bear the worst effects. This frame incorporates important moral considerations (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016), and is linked to the care/harm, fairness/cheating (Graham et al., 2012) and nurturant frames (Lakoff, 2016). Despite the links of this frame to a framing more typically preferred by liberals, the methods used for this frame were particularly unique. Many of the speakers who used this frame were not concerned parents or adults, but the children themselves. Outside of the specific frame, having children come and speak about their concerns and fear to legislators and other listeners was a particularly powerful message. This showed

fear and concern among those who would be impacted by climate change, and put faces to the issue.

Leadership – This frame occurred at the sixth-highest rate, and was often used when asking for leadership among legislators, or to discuss Washington State as a leader in the United States. Speakers would often end their argument with a call to action that included leadership. Based on the roles of the legislators, speakers would ask for leadership from them within their respective roles, and emphasize the duty they had within those roles. This frame may have appeared based on the context of the public hearings, since legislators are leaders and rule makers. According to the literature on climate change framing and communication, this frame has important moral implications (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016), particularly for legislators. Those who take on the responsibility and role of legislators as leaders may have an affinity for the role of leadership. Additionally, due to the other audience members, this puts visible public pressure from constituents onto the legislature. Rather than a closed meeting or written testimony, there are witnesses and there becomes a record showing people asking for change from legislators. This is also linked to the authority/subversion moral frame, which will be discussed in the Moral Foundations Theory section (Graham et al., 2012, 2009).

Responsibility/accountability – This frame occurs at the eighth-highest rate, but has increased a fair amount from 2007-08 to 2017. This may in part be linked to the increase in future generations/children, as many of the speakers discussed the responsibility of the

legislature to future generations as their future constituents. The rising use of the equity/equality frame may also have contributed to this increase. There was discussion of the importance of accountability in climate change action, and taking responsibility for what we as a species or individually, have done to contribute to climate change. This was often linked to equity, and the responsibility to help those who will be unfairly impacted by climate change. This frame is similarly linked to the strict moral framing that appears in Lakoff's (2016) State as Family model. Lakoff discusses conservative preferences for personal responsibility within his model, which applied to certain instances of this frame. Despite the links to several different moral issues, this frame may face challenges due to the unwieldy nature of climate change. While it is critical for our species to take responsibility for climate change and have accountability in that execution, this is not an issue that has exclusionary responsibility. Due to the longitudinal nature of climate change, it is not the specific responsibility of any one group or generation of people. This makes addressing it extremely challenging, and creates issues in the execution of that collective responsibility. During the hearings themselves, one legislator raised the issue of collective versus state responsibility, citing that other states who contribute more greenhouse gases will do less mitigation action than Washington. This issue of who is responsible for the cost and work is inherent in climate change mitigation, and it is a significant challenge in the context of this framing.

Science – This frame is tied for second place with Washington State in overall rate of occurrence. It also increased from 2007-08 to 2017. The high rate of occurrence is unsurprising considering that climate change is studied and discussed as a scientific

phenomenon. This frame will be discussed more at length within the issue framing and science communication section of this work, since the use of scientific language has significant implications in that field. Although science communication does not necessarily explicitly discuss science as a frame the way Shanahan might, they implicitly discuss scientific framing through the discussion of language (ecoAmerica, 2013; Fahey, 2014b, 2014a; Somerville & Hassol, 2011). This frame may have greatly varying results, due to differences in how science itself is articulated. This is where science communication comes into the equation as an evaluative tool, something that this frame itself doesn't completely capture. The frame itself includes the discussion of science, whereas science communication is how that science is discussed. The frame may be activated by the use of scientific jargon, something that science communication experts generally advise against. Due to these challenges, how effectively this frame was used has significant variation based upon additional methods used by the speakers as opposed to the strict use of the frame itself.

Washington State – This frame is tied for second place with science for rate of occurrence. It occurred at a lower rate in 2017 compared with 2007-2008. Considering the context for the documents were public hearings for the Washington State Legislature, this frame appearing is also unsurprising. However, when considering both the moral (Fahey, 2014b, 2014a; Hulme, 2009; Lakoff, 2010, 2016; Porter, 2014; Wolsko et al., 2016) and science communication implications (ecoAmerica, 2013; Fahey, 2014b, 2014a; Somerville & Hassol, 2011), this frame becomes more relevant. This frame was used to connect with the legislators as both something the speaker and legislator had in common,

and to discuss the moral importance of Washington State. This is also true of the rest of the audience, as many people who may not have strong concern for climate change may have strong concern for the future of Washington State. Speakers would often discuss Washington as a participant in a larger national or worldwide community, evoking the loyalty/betrayal frame. This also was used to frame the legislators as having a responsibility to remain loyal to their fellow Washington citizens, by protecting them and ensuring they have a stable climate.

Between all the groups, the trends in framing are similar to the overall trends in rate of occurrence in traditional framing. The majority of groups used science, Washington State, and economy/money as their highest relative frame use in varying order. The one exception was union, though the attendance of union spokespersons at public hearings did not dramatically change over time. This means the changes over time would likely not be caused by a change in union attendance.

II.II. Climate change versus global warming

The climate change and global warming frames were determined from the relevant literature on frame preference (Benjamin et al., 2017; Schuldert et al., 2011; Villar & Krosnick, 2011). Due to the large amount of literature on frame preference, and the likelihood they would appear, these frames were selected for initial coding. These frames did consistently appear throughout the hearings, though the use of the global warming frame decreased as the climate change frame increased.

Climate change – This frame has increased over time, while global warming has decreased. This may help explain the decrease in framing effect over time, as the overall exposure to the global warming frame decreases, and climate change becomes the normal and accepted term. Benjamin et al. discussed this in their work, asserting that the difference in time between their work (2017) and previous work completed by Schuldt et al. (2011) could alter the strength of the framing effect. The climate change frame was used more often by all speaker categories, though the rate of use among the groups varied. Union representatives used the climate change frame exclusively, and governmental agency/public institution speakers used it 18 times to 1 for global warming. The differences become less dramatic in other groups, NGO/nonprofit being the third largest relative user of the climate change frame to the global warming frame. Overall, the groups use the climate change frame more often, and the trends over time show an increase of this frame. Based on the possibility of frame preference by Republicans for the climate change frame, and the more neutral frame preference by Democrats, this increase in the climate change frame may increase bipartisan preferences for the frames used in the public hearings (Schuldt et al., 2011; Villar & Krosnick, 2011).

This frame itself was coded based upon the language used by supporters, specifically the use of the term “climate change.” Based upon the literature on framing and what constitutes a frame, this is not the most complete method of analyzing the appearance of this frame. This method was selected due to the challenging nature of deciphering the differences between the climate change and global warming frames by supporters if the terms were not specifically used. The global warming frame is often discussed as being a more catastrophic or denialist frame, something that creates

challenges when only looking at testimony from supporters. If testimony from the opposition had been included, these frames may have been more accurately articulated and selected due to the contrasting framing between the groups.

Global warming – This frame had decreased over time, as the climate change frame has increased. This lessening exposure to the global warming frame may be linked to the decrease in framing effect over time found in work by Benjamin et al. (2017). This frame was used less frequently by all speaker category groups. The groups that use this frame the most proportionally are NGO/nonprofit, followed by elected official, then private company. The decrease in use of this frame was likely not caused by speaker changes, since NGO/nonprofit went up in attendance from 2008-09 to 2017. Elected official and private company went down, but made up a smaller proportion of the population overall.

The use of the climate change versus global warming frames among the groups mirrors the changes over time, with all groups using the climate change frame more than the global warming frame.

III. Positive and Negative Message Framing

Negative message framing – Although this frame appeared at a lower rate overall, it has seen an increase over time. This may partially be explained by a difference in speaker category group participation. Among these groups, citizen, NGO/nonprofit, and union all used negative message framing more than positive message framing. This may explain the increased negative message framing in more recent hearings, as participation by the

citizen group and NGO/nonprofit group have both gone up. When considering the +/- message framing implications, an increase in negative message framing may not encourage support for climate change mitigation action (Gifford & Comeau, 2011), although, it has also been proposed that strictly focusing on benefits of environmental mitigation may feel deceptive to the listener (de Vries, 2016). Insofar as +/- message framing goes, not relying on strictly positive or negative message framing is a reasonable approach. With that in mind, what balance to strike would be hard to say without additional research into what split of positive and negative message framing is most appropriate or effective. This work could be useful to see basic trends in +/- message framing, and work towards research that could look for the most effective balance of positive and negative message framing. In science communication, the importance of avoiding discussing only the negative effects of climate change is discussed, in particular the avoidance of making your audience feel powerless through negative message framing (ecoAmerica, 2013; Fahey, 2014b). This will be expanded upon at length in the issue framing and science communication section.

Positive message framing – Although this frame appeared at a higher rate overall, it has gone down in use from 2007-08 to 2017. This change may also partially be explained by speaker category changes. There has been a decrease in 2017 in participation from the elected official and governmental organization/public institution groups, who use proportionally more positive message framing than citizen or NGO/nonprofit. Participation from the private company group has gone down as well, which is a group that uses more positive message framing overall compared to other groups. These speaker

category changes likely help account for the change in +/- message framing over time. As discussed in the negative message framing section, focusing on strictly positive benefits (de Vries, 2016) or overwhelmingly negative framing may not be effective (Gifford & Comeau, 2011). In order to determine how effective or ineffective these frames are would require additional research. Outside of the general research into +/- message framing, audience considerations are important for +/- message framing selection. Using strictly negative message framing for a group of children may get their attention, but it could certainly be considered cruel or inconsiderate. In part, the effectiveness of convincing an audience through framing is different than selecting a framing that is appropriate given other considerations.

IV. Moral Framing

The following section will discuss the findings of this research in the context of the specific models used for moral framing. These include Moral Foundations Theory (Graham et al., 2012) and State as Family (Lakoff, 2016). The discussion will expand on each specific frame in the context of the literature and hearings.

IV.I. Moral Foundations Theory

Authority/subversion – This frame appeared at the second highest overall rate and has decreased in use from 2007-08 to 2017. This decrease may partially be attributed to the decrease in participation from the private company, governmental agency/public institution, and elected official groups. These groups tend to use the authority/subversion frame more, particularly in discussing leadership and rules. This frame links to the

traditional frame of leadership, which has also gone down in occurrence over time. Speakers tended to discuss leadership, and the importance of delegating authority. Self-identified conservatives have been shown to have a stronger preference for this moral frame than self-identified liberals (Graham et al., 2012, 2009). The decrease in this frame over time highlights a frame shift to a less conservative framing of climate change support. Outside of the articulation of this frame and foundation, the reality of this framing is likely much more complex than the actual occurrence of the framing. Aside from the significant diversity among the audience and political spectrum in general, simply using a frame does not mean it was used effectively in an argument. Other concerns, such as argument structure and logic can impact it. Furthermore, the clarity with which a supporter speaks, or even the listener's mood can all have an effect on the argument. It also should be addressed that the liberal and conservative methods of categorizing people is a large oversimplification of a much more complex reality. While this has been used in the literature and is generally considered a useful method for segmenting audiences, the framing becoming "less conservative" is actually much more complex and includes many more variables than measured or considered within this work.

Care/harm – This frame appeared at the highest overall rate and has increased from 2007-08 to 2017. As participation from the citizen and NGO/nonprofit groups went up between 2007-08 and 2017, combined with the higher rate of use within these groups of the care/harm frame, this likely contributed to the increase over time. This frame is connected with the future generations/children traditional frame. Speakers often

discussed the impacts of climate change on specific groups, and the importance of caring for these groups and their futures. This frame tends to appeal to self-identified liberal groups more than self-identified conservatives (Graham et al., 2012, 2009), and its increase over time shows an increase in liberal framing. Again, an increase in liberal framing overall is more complicated than a shift in language or frame, and instead includes many variables that fall outside of the scope of this work.

Fairness/cheating – This moral frame appeared at the third highest rate, increasing between 2007-08 and 2017. The changes over time in fairness/cheating framing may partially be attributed to changes in speaker category participation. As the citizen and NGO/nonprofit groups increased in their participation, there was an increase in fairness/cheating framing. These groups both used the fairness/cheating framing as their second most common framing. This frame is tied to the equity/equality frame, since the fairness/cheating moral foundation focuses strongly on equality. Speakers often discussed the need for equitable, fair, and just climate action. Similar discussion around the future generations/Children frames appeared, and the importance of ensuring their future. This frame has been shown to appeal to self-identified liberals more than self-identified conservatives (Graham et al., 2012, 2009). The increase in this frame over time shows an increased framing towards liberal groups in general, though this must be stated with reservation.

Loyalty/betrayal – This frame appeared at the fourth highest overall rate and decreased in occurrence from 2007-08 to 2017. This moral frame is at times related to the

Washington State frame, as speakers discussed the state's responsibility to work within national and international groups. Both of these frames trend downward over time.

Similarly, the elected official and private company groups use this moral frame more frequently, and their participation from 2007-08 to 2017 trended downward. This frame appeals more to a self-identified conservative moral framework than a self-identified liberal one (Graham et al., 2012, 2009). This decrease in loyalty/betrayal framing has shown a decrease in conservative framing over time. This decrease comes with reservations regarding the full accuracy of categorizing people as strictly liberal or conservative. Even so, this is generally considered a reasonable method for segmenting audiences and determining differences.

Sanctity/degradation – This frame appeared at the lowest overall rate and slightly decreased from 2007-08 to 2017. This frame was not largely preferred by any group, and has likely not been impacted dramatically by speaker category participation. This is a framing preferred by self-identified conservatives (Graham et al., 2012, 2009), and the slight decrease shows a slight decrease in conservative framing. Despite the general lack of use, this frame could potentially be a significant way to interject or begin framing climate change to a more diverse audience. With the focus on defilement and degradation, this frame relates strongly to land stewardship and protection from destruction. When this frame was used in the hearings, it was often through a religious or stewardship lens. Increasing the use of this method for framing climate change could prove useful, and is an underutilized framing method insofar in public hearings.

IV.II. State as Family

Nurturant – This frame appeared at a higher overall rate than strict, increasing from 2007-08 to 2017. All speaker groups used the nurturant frame more than strict, with the exception of the private company group. It should also be mentioned that the ratio among groups is different, with NGO/nonprofit using nurturant at a higher ratio than strict. While other groups still use nurturant framing more, the difference in relative use is less. This also may help explain the increase in nurturant framing overall, as the NGO/nonprofit group saw increased attendance in 2017 compared to 2007-08. This increase in nurturant framing speaks to an increase in framing for a liberal audience based on State as Family (Lakoff, 2016), though, in the context of Lakoff's (2016) model, there must be some reservations held regarding the effectiveness or accuracy of his characterization of these two groups. Aside from the significant challenges of categorizing people into dichotomies, Lakoff himself is a strongly self-proclaimed liberal, creating concern regarding personal bias within his work. Additionally, framings proposed by Lakoff in other work suggests that his preference for liberal framing may somewhat cloud his judgment for what will be effective for different groups. His proposal to replace regulation with protection, while an important jargon shift, may lead listeners to hear a more liberal care/harm framing of environmental issues as opposed to a more conservative framing (Graham et al., 2009; Lakoff, 2010).

Strict – The strict frame appeared at a lower rate than nurturant, and decreased between 2007-08 and 2017. The decrease in strict framing may partially be explained by the decrease in private company attendance, as they were the only group to use strict framing

more frequently. This decrease in strict framing speaks to a decrease in framing for a conservative audience based on the State as Family model (Lakoff, 2016). Again, while Lakoff's model has been empirically supported to some extent (Barker & Tinnick, 2006), it is not a complete method for characterizing diverse groups.

V. Issue Framing

I will now discuss the overall issue framing and intersections with science communication issues. I will discuss each type of framing and where it has changed, then the overall implications for general issue framing.

V.I. Overall issue framing

Overall, the following were the climate change issue frames used in testimony before the Washington State Legislature, in order of the frequency in which they were used (from highest to lowest) within their type.

General frames:

1. Economy/money
2. Science (tied with Washington State)
2. Washington State (tied with science)

Climate change versus global warming:

1. Climate change frame

Positive and negative message frames:

1. Positive message framing

Moral Foundations Theory:

1. Care/harm
2. Authority/subversion
3. Fairness/cheating

State as Family:

1. Nurturant

Taken together and based upon the relevant partisan framing literature (Benjamin et al., 2017; de Vries, 2016; Graham et al., 2012, 2009, Lakoff, 2010, 2016; Schuldt et al., 2011; Shanahan, 2007; Villar & Krosnick, 2011; Wolsko et al., 2016), the overall average framing is more bipartisan, generally speaking, when compared to strictly the 2017 framing. I will expand on the bipartisanship of framing, then turning to specific frames briefly with regard to their science communication implications.

With regard to bipartisanship of framing, the use of the climate change frame over the global warming frame may appeal more to conservative groups, without ostracizing liberals (Schuldt et al., 2011; Villar & Krosnick, 2011). Though the framing effect has possibly lessened over time (Benjamin et al., 2017), using the preferred term may still have a small frame preference for conservatives. Though other frames also assist in creating a potentially overall more bipartisan framing than the strictly 2017 issue framing.

The higher use of the frames economy/money, Washington State, and authority/subversion in overall framing compared to 2017 may help contribute to bipartisanship. With regard to economy/money, based on Lakoff's (2016) State as Family model, conservatives place strong emphasis on efficiency, including economic efficiency.

The use of the Washington State frame is linked to the larger use of the loyalty/betrayal frame, which is preferred by conservatives (Graham et al., 2012, 2009). This is also true for the authority/subversion frame, which occurs at a higher rate in this overall framing as well, compared to 2017. This framing may have some bipartisan strengths, and some strengths and challenges with regard to science communication.

This framing incorporates issues regarding the importance of positive message framing both academically (Gifford & Comeau, 2011), and in science communication (ecoAmerica, 2013; Somerville & Hassol, 2011). Focusing on benefits of mitigation, and not getting completely bogged down by negative effects, may help engage audiences more. The overall trends also show science as a slightly less frequently used frame.

Science is the second most frequently occurring frame within this framing, where it is the first in 2017. This means that 2017 used more scientifically based discussions and arguments, language, and jargon. While science communication includes science, it is critical not to get bogged down in scientific language. This framing used less science heavy arguments, which may help increase accessibility. Focusing on arguments that include issues outside of strictly the scientific realm is critical for enhancing communication.

While science communication includes science, the importance of moral arguments is emphasized throughout the literature (ecoAmerica, 2013; Fahey, 2014b, 2014a; Hulme, 2009; Somerville & Hassol, 2011). Partisan issues aside, moral arguments were made within both framings, with speakers trying to connect with the legislators on issues they cared about. Many speakers relied on stories, personal connections, and past experiences to highlight what climate change meant to them.

V.II. Climate change issue framing in 2017

In 2017, the following were the climate change issue frames used in testimony before the Washington State Legislature, in order of the frequency in which they were used (from highest to lowest) within their type:

General frames:

1. Science
2. Future generations/children
3. Economy/money (tied with Washington State)
3. Washington State (tied with economy/money)

Climate change versus global warming:

1. Climate change frame

Positive and negative message frames:

1. Negative message framing

Moral Foundations Theory:

1. Care/harm
2. Fairness/cheating
3. Authority/subversion

State as Family:

1. Nurturant

Though not in the top occurring, equity/equality has also seen a huge increase in rate of occurrence since 2007-08. Taken together and based upon the relevant partisan framing literature (Benjamin et al., 2017; de Vries, 2016; Graham et al., 2012, 2009,

Lakoff, 2010, 2016; Schuldt et al., 2011; Shanahan, 2007; Villar & Krosnick, 2011; Wolsko et al., 2016), this framing is overall less bipartisan, generally speaking, compared to the overall framing. I will expand on the increased liberal partisanship of framing, then specific frames briefly with regard to their science communication implications.

The moral frame shift of increasing fairness/cheating over authority/subversion increases the overall liberal framing (Graham et al., 2009). This is strongly connected with the increase of the traditional frame equity/equality. While this frame is not the highest occurring, it is worth mentioning due to the massive overall increase from 2007-08 to 2017. The care/harm and fairness/cheating frames are both influenced by the future generations/children frame, creating an overall more liberal framing compared to the general trends. With regard to other concerns for science communication, the reliance of the 2017 framing on the science frame also reduces accessibility.

Science is the most frequently occurring frame within this issue framing, where it is the second in the overall framing. Based on science communication literature, focusing on moral arguments and a reduction in the occurrence of jargon is useful for a broader audience (ecoAmerica, 2013; Fahey, 2014a, 2014b; Somerville & Hassol, 2011). This reliance on scientifically based arguments and language may cause barriers to listeners. As a caveat however, those speaking in these hearings are making their arguments to the legislature using language found in the bills themselves, so there may be more familiarity. Some speakers were also invited specifically to give scientific background, and although the language they used included scientific terms, it was not unlike the language found in the bills. Technical and scientific terms were used but, in this context, it may be more appropriate given the more experienced audience and the technical nature of the bills.

With regard to science communication in a moral sense, generally there may be some strengths to this 2017 framing.

With regard to moral concerns, even if this framing relies more heavily on liberal framing, it does a better job of incorporating moral framing in general. The traditional frames used were more strongly connected to moral frames, with regard to equity/equality and future generations/children. Even if the frames may appeal to a liberal audience more, the speakers took the time to lay out and discuss the moral implications of climate change. This was particularly striking with the increased participation of citizens, specifically children. Having a child speak about fear for the future and concern about the environment helped put a face to the name and impacts of climate change.

VI. Limitations

There were several limitations to this study. First off, the use of video documents limited the ability to do specifically targeted word searches or densities, which complicated the coding process. This meant the coding process did not have guided language densities as a guide. Secondly, this work only examined how climate change mitigation supporters framed their arguments. Seeing how those opposed framed theirs may have given additional insight, but was not selected due to time constraints and the nature of the research questions. Third, there were no controls put into place regarding similarities between the language of the bills themselves and the speakers, which often mirrored one another. Last, sampling that had more even spread among groups and number of speakers may have given more normalized data on a year-to-year basis.

VII. Areas for future research

With regard to future research, looking more in-depth at how citizens and NGO/nonprofits as specific groups frame their arguments could inform how to communicate with these groups and provide information about how to increase bipartisanship in framing. Additionally, research into effective balances of positive and negative message framing could guide climate change mitigation supporters. Further research into audience segmentation and framing in practice could reveal a better method of characterizing groups that can more fully capture diversity of opinion, as opposed to relying on a dichotomous political scheme.

VIII. Conclusion

This thesis research found differences among how categorical groups framed their arguments in public hearings at the Washington State Legislature from 2007 to 2017. In part, these shifts can be attributed to shifts in participation among the supporter categories. Generally, these frame shifts lean more liberal than conservative. Additionally, there were overall frame shifts among all frame types including traditional, message, moral, and issue framing.

There were significant differences among how speaker categories articulated and framed their arguments, with NGO/nonprofit and citizen using frames that may appeal to self-identified liberals more than conservatives according to the literature on climate change moral framing (Graham et al., 2009; Lakoff, 2016; Wolsko et al., 2016). Groups such as private company and elected official used more conservative moral framing and,

as their participation has declined in recent years, so has conservative moral framing. Due to the changes in participation among groups, the overall moral framing has become more liberal and less conservative according to the moral framing models used for this analysis (Graham et al., 2012; Lakoff, 2016).

Other frame shifts have occurred among general frames, the climate change versus global warming frames, and +/- message framing. For general frames, the use of the equity/equality and future generations/children frames have increased, which are strongly related to the increases in liberal framing and participation among the NGO/nonprofit and citizen groups. All supporter categories have increased in their use of the climate change frame over the global warming frame, which shows an increase in bipartisan framing for Democrats and Republicans (Schuldt et al., 2011; Villar & Krosnick, 2011). Though similar to the issues in a liberal and conservative dichotomy, recent research has shown a decrease in this framing effect with more complex measurement tools (Benjamin et al., 2017). Despite this, seeing the differences in practice and considering the partisan implications is still an important practical finding for this work. Insofar as +/- message framing is concerned, there has been a marked increase in the rate of negative message framing employed by supporters, likely also due to a shift in participation among NGO/nonprofits and citizens, who employ negative message framing frequently. In general, there have been some significant changes in how climate change is framed in practice over the past ten years, both generally and among specific categorical groups.

Climate change framing has changed over the past ten years in many respects and among different groups. This includes changes in traditional, message, moral, and issue

framing over time and among different categories. In the following chapter, I will explore and reiterate the implications and importance of these findings.

Chapter Six: Conclusion

While the previous chapter discussed the findings and their implications for this research, including the frame shifts that have occurred between groups and over time, this chapter will explore the future of climate change communication and mitigation action.

The following subquestions were asked and examined through this work: *How have supporters of climate change mitigation policy articulated their arguments in public hearings at the Washington State Legislature over time? Are there differences among varying groups? According to climate change framing scholarship, do these frames potentially appeal more to specific political parties or groups?*

In answer to the research questions, this work found differences among the selected categorical groups and how they framed climate change in public hearings at the Washington State Legislature over the past ten years, from 2007-2017. Speakers were shown to primarily use moral framing that may appeal more strongly to political liberals. These shifts can partially be attributed to changes in participation among the selected groups, in particular the increased NGO/nonprofit and citizen participation. In general, the moral framing employed by these supporter categories leaned to a liberal persuasion based upon the specific models used for this work, Moral Foundations Theory (Graham et al., 2012) and State as Family (Lakoff, 2016). There were additional frame shifts over time in each type of frame used, including traditional and +/- message framing. Traditional frame shifts included an increase in the use of the equity/equality and future generations/children frames, in addition to an increase in the climate change frame. Message (+/-) framing has become increasingly negative over time. These frame shifts,

aside from the climate change frame, can all be largely attributed to changes in supporter category participation over time.

The changes among individual frames make up a shift in issue framing overall, as the frames and arguments used in more recent hearings may appeal more strongly to liberal groups than they did previously. While the framing used to discuss climate change has leaned more towards the liberal persuasion in general over the past ten years, this has become increasingly apparent in recent hearings. Regardless of the importance of the values being put forwards in these hearings, the manner in which climate change is being framed is not strongly bipartisan. While the interactions a person has with climate change and framing is not solely defined within the public hearings, moving towards a more bipartisan framing approach may be useful in communicating across party lines. How we talk about issues influences how we think about them. Communication about complex issues is critical to moving forward on issues such as climate change mitigation action.

Due to the criticality of this issue, understanding how people frame and articulate their arguments about climate change can help lead to a new understanding of where to intervene in the communication process. This work has investigated how people discuss climate change using several different framing models. The conclusion that changes in supporter category participation may have influenced the issue framing of climate change has opened up new opportunities for research regarding science communication and framing among specific categorical groups. If we are to implement climate change mitigation action through legislative avenues, we must be careful to frame the issue in a way that resonates among people, not only one political party.

The United States in general, and Washington State specifically, have yet to pass large scale climate change mitigation policy that addresses the issue with the urgency and precision required. With the United States' expressed intention to withdraw from The Paris Accord and the recent failure of yet another carbon tax proposal in Washington State, the need for effective communication about climate change is more critical than ever. One of the primary avenues, if not the primary avenue for climate change mitigation is legislation. This means that effective communication within public hearings can help set the stage for effective and inclusive mitigation. Based upon the findings within this research, we now have a basic understanding of how different groups of climate change supporters frame the issue, and how it is framed in general among all groups. This means there is now a baseline understanding that can be built upon in research, outreach, and practice for more effective communication.

Future research regarding framing in practice could be used to explore either legislative communication or other climate change framing in more detail. This could include additional research regarding public hearings, legislative briefs, bill language, or internal legislative communications. Outside of that scope, looking at media frames, nonprofit publications, government reports, or other climate change communication could expand on framing in practice. This could be more generalized or specific than this work, and perhaps could identify a more effective classification method for diverse groups. Academic research is not the only tool for increasing knowledge and effectiveness of communication, though, as outreach is critical as well.

Due to the highly liberal framing methods employed by the NGO/nonprofit and citizen groups, outreach from science communication experts and educators could focus

on capturing and connecting with these groups with regard to climate change framing and communication. Focusing future work not only on additional research into the framing these specific groups use, but on how to better communicate and connect them with resources on framing and science communication could help lead to more bipartisan framing of climate change issues. While party lines or dichotomies may not be the most effective method of characterizing groups, education about argument framing and the science behind it could help people choose and articulate their support more carefully. Additionally, and outside of strictly framing, by connecting with these groups science communication experts could provide education about other methods for increasing the effectiveness of their communication, such as the avoidance of jargon and specific structural changes.

By furthering research into climate change framing in practice, and education to specific groups that could increase the bipartisanship or structure of their arguments, we can continue to work towards developing effective mitigation strategies. There has been an observable change in participation among groups, one of which is the increase of participation from citizens. This is a critical moment for intervention in climate change communication, as citizens are beginning to increase their personal participation and agency in this issue. By educating and directing the efforts of passionate citizens who care about the environment, science communication experts can help them participate in the legislative process more effectively while facilitating mitigation of this issue. If climate change is addressed in a way that people can understand and care about, communication experts can create a multitude of opportunities for positive and empowering change through outreach for both people and the environment.

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