Lack of Compromise and Understanding Due to Network Pressure in the Congressional Controversy Around Michael Mann's Climate Change Research

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

Understanding the technical and scientific factors around climate change provides only a partial view of how climate action can lower greenhouse gas emissions. A fuller understanding can be grasped by analyzing the cultural challenges, such as climate change denial, that need to be overcome to make sure that mitigation technology is funded and implemented. Currently, it is not fully understood why there is lack of understanding between climate deniers and climate scientists (Bjornberg, 2017). This is particularly important where disagreement with human caused climate change and the need to slow down global warming directly inhibit climate action. In the U.S. Congress, senators speak and vote against the funding and implementation of new technology such as carbon dioxide capture and storage (CCS) in direct opposition to climate research (Climate of Distrust, 2005). This destabilizing condition has a significant influence on government spending and global economies based on a network that is not completely understood (Besel, 2011). If climate action, specifically employing CCS which "has the potential to make a big difference to greenhouse gas emissions," continues to be stifled and belittled, more carbon dioxide will be released into the atmosphere (IEAGHG, 2012, n.p.). The excess carbon dioxide will accelerate global warming and cause abnormal droughts, altered precipitation patterns, and more intense frost seasons (EPA. Overview of Greenhouse Gases, 2020; Mann, 1998; NASA, 2020). Without action, consequences from global warming will cause significant humanitarian and economic ruin to millions of people by destroying industries through climate change and causing devastation by severe weather (United Nations, 2020, n.p.; Wright, 2013).

By examining a case study where U.S. Senator Joe Barton criticized climate scientist Michael Mann's research in a congressional hearing, this paper will develop a better understanding of the cultural opposition around climate action as demonstrated by the networks

supporting Barton and Mann. This paper will also address why neither the climate scientists nor the government officials fully attempted to understand the other's reasonings through two blended frameworks, Richard Besel's "Opening the 'Black Box' of Climate Change Science" and Venturini's "Diving into Magma". These insights and understandings find that network pressure influenced the main actors to avoid understanding and compromise, adding to the basis of knowledge supporting the implementation of future climate action.

Controversy Between Barton and Mann was Fueled by Network Support, a Difference in Scientific and Ideological Views, and Failure to Compromise

Networks and Research Support Barton and Mann to Strengthen their Stance on Climate Action

People who are opposed to climate action, are generally opposed because they deny climate change is occurring or is caused by humans due to ideological, scientific, and political reasons (Bjornberg, 2017). In the last 25 years climate change "denial indeed had a significant negative impact on societal debates and decision-making, [and that] despite huge advances in environmental sciences over this time period, denial prevails in some cases" (Bjornberg, 2017, Pg. 239). This denial is clearly evident when legislators use their position to inhibit climate action such as when in 2005 Senator Joe Barton asked three climate researchers for information on certain paleoclimate research in an attempt to discredit it. This research included the 1998 and 1999 papers Mann co-published on research that reconstructed the global average temperature in the 20th century shown in Figure 1 (Climate of Distrust, 2005). Barton asked for the background information to investigate the 'significance of methodological flaws and data errors' Barton suggested were in the study. Despite subsequent studies supporting Mann's observation, Barton

continued to “use his political influence to put pressure on the scientific process” (Climate of Distrust, 2005, Pg. 1). Similarly, in 2007 Senator James Inhofe discredited the science of climate change and attacked Mann’s work on the Senate floor days before the vote on the Climate Stewardship Act (Wright, 2013). Ultimately the bill was rejected, stifling a program to decelerate the production of greenhouse gases.

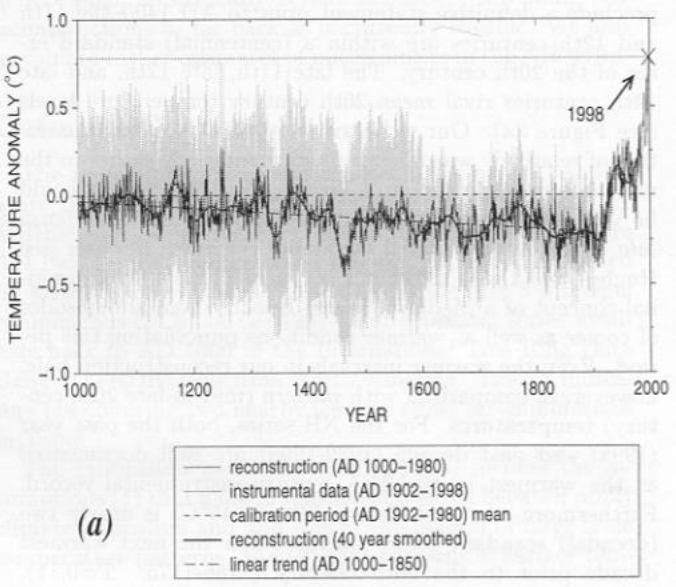

Figure 1. Millennial Temperature Reconstruction (Mann, 1999)

The disagreement, senate hearing, and subsequent controversy were analyzed to better understand the cultural opposition. Barton initiated the argument when he requested additional background information from Mann and his fellow researchers about their 1998 paper through letters with a tone that “leaves no doubt to [Barton’s] agenda” (Besel, 2011; Climate of Distrust, 2005, Pg. 1). In July 2006, House committee decided to hold hearings investigating the 1998 paper and the potential flaws in the research behind the millennial temperature reconstruction data. “Barton’s attempt to bring scientific disagreement into…congress ignited a heated controversy,” which spurred a battery of climate scientists and other lawmakers who support climate action to come support Mann (Besel, 2011, Pg. 121).

> What is at stake in this controversy is captured in a letter written to Barton by 18 of the nation’s most influential scientists: This investigation could compromise ‘‘the independence of scientific opinion that is vital to the pre-eminence of American science as well as the flow of objective science to the government.’’ - Besel, 2011. Pg. 122

In this letter, House Science Committee Chairman Sherwood Boehlert and Ralph Cicerone, President of the National Academy of Sciences, both feared that Barton's investigation was too intimidating and "such attacks [would] chill future scientific inquiry" (Pg. 121). Alan Leshner, a representative of the American Association for the Advancement of Science, went on to argue that Barton did not push to initiate the hearings to create a better understanding for everyone involved, but rather to simply discredit the findings. By actively joining together and arguing against Barton as a single network, "global warming believers were able to use the weight of the entire network as a potent inventional resource" (Pg. 131). However, at the end, the climate scientists and government officials involved in the hearing did not reach an effective consensus on the topic of how the U.S government could enact climate action to satisfy each actor's needs.

Overwhelming Network Support Drives each Actor Away from Cooperation and Compromise

Despite the social and political repercussions from the hearing and the overwhelming support and pressure from the climate change activists' network, no change or legislation impacting climate action was passed (Besel, 2011). These differences of view could have served as the basis for constructive conflicts that keep teams from "degenerating into dysfunctional interpersonal conflict" (Eisenhardt, 1997, Pg. 78). Constructive conflicts over the issues can lead to new, common understandings between actors as they encourage each actor to understand the decisions made. Although, 'constructive communication' is a vague term that cannot fully allow the failures of conflict to be understood, the specifics of the argument can be analyzed to provide some insight as to why the actors involved did not compromise towards each other's views. To identify why there was a lack of compromise between the actors, it needs to be identified why

there seemed to be a lack of cooperation and available solutions and why it appeared all actors had a lack of knowledge or understanding of the other actors' beliefs and goals.

What is unknown and needs to be addressed to further understand "scientific controversies around global climate change" is to consider why politicians including Inhofe and Barton aggressively targeted Mann to discredit his research rather than attempt to reach an understanding (Besel, 2011, Pg. 122). Analyzing Barton's argument in the 2006 hearings will allow a deeper insight into what motivated him to instigate the conflict and what his goals for the hearing were. Barton's reasons, along with the vast majority of climate deniers, could be ideological, scientific, political, or some combination of those (Bjornberg, 2017). From a scientific standpoint, Barton used a 2003 Energy & Environment report by Stephen McIntyre, "an amateur statistician and longtime mining industry employee", and Ross McKitrick that argued Mann's 1998 paper was "full of errors and defects" (Besel, 2011, Pg. 121). Throughout the hearing Barton spoke as though he believed Mann's techniques were faulty and needed to be corrected. However, Barton could have also chosen to discredit Mann's research from a political standpoint due to the immediate economic benefits. At the time of the hearings, Barton was the House Energy and Commerce Committee Chairman and his previous work exempting cement plants from stricter anti-fog rules demonstrated that he politically favored the economic benefits from industry growth over protecting the environment (Besel, 2011; Climate of Distrust, 2005). Climate action has not been done before on this scale, so it is unknown how effective it would be, what it would cost, and what unknown benefits could come from it (Green, 2019). Ultimately, it cannot be fully predicted whether climate action would be economically beneficial for the specific industries in Texas that Barton represented, but climate action, such as the Paris Agreement, is a huge stimulus to countries' economies as it could produce $26 trillion in

economic investments into the energy, food, industry, and water sectors as well as twenty-four million new jobs (Green, 2019). Finally, Barton could ideologically or religiously believe man-made climate change is not a real problem, and climate action is a waste of resources (Bjornberg, 2017). Better understanding the roles of each of these separately will allow the arguments made climate deniers like Barton to be better understood without simply grouping them all together in a dismissing way. Again, the importance of understanding the ideas suggests that being able to share ideas and develop compromises matters just as much as the reasons themselves.

The methodology used in this paper will contribute to our understanding of how those involved defended their beliefs within the controversy with the help of actor-networks. Understanding why the actors involved did not reach an effective compromise and how they could have reached it would allow future actors to navigate the controversy, resulting in climate action. The failure to reach a compromise in the 2006 hearings delayed climate action and extended the already severe effects of global warming. By analyzing the communication techniques that encouraged and discouraged a compromise, the issues that inhibited a compromise or any legislative action be better identified. For any effective climate action to be enacted, a compromise must be negotiated between all actors involved; therefore, it is crucial that all issues in the conflict are identified and addressed in the solution. Understanding these issues from this past case study allow for future negotiations to better identify and prepare for them. It is important to learn from these case studies to better facilitate future conflicts to help vital climate action be enacted more effectively and efficiently.

Framework for Understanding Network Impact on Controversies and Compromises

Analysis of the Network Influence on Barton and Mann during the Congressional Hearing

The sociotechnical research and analysis by Besel in "Opening the ''Black Box'' of Climate Change Science: Actor-Network Theory and Rhetorical Practice in Scientific Controversies" serves as the foundation to answer the questions of why did Mann's 1998 research receive the pushback it did, and how did the situation prohibit or stifle effective communication. Besel analyzed the July 2006 congressional hearings, which investigated Mann's research, "through the critical lens of actor-network theory" (Besel, 2011, Pg. 120). The important findings from Besel's research culminate in two points. First, "global warming believers were able to use the weight of the entire network as a potent inventional source" to defend the singular actor that was attacked (Pg. 120). This was evident by the publicly released letter where climate scientists and other lawmakers joined forces to support Mann and denounce Barton's actions and investigations. The second inference Besel made is the importance of rhetoric in climate-based controversies. Besel states that rhetoric in a controversy is the word-choice, assortment of facts and information, and collection of voices used to argue a stance. Rhetoric can be changed by choosing which information to explain background on and which to simply 'black box' as well as choosing whose voices to incorporate into the argument. Mann's research can be understood as "a sociotechnical assemblage of black boxes" where most actors involved did not understand the process behind the research, but Mann and his network were still able to explain and recognize the importance of the work (Pg. 123). Being able to black box, explain the research with a short inscription and not the full scientific process, is vital to arguing in a scientific controversy, as every detail cannot be explained to everyone. Besel further describes that rhetoric can be used to generate a response from the network to support a single point, by incorporating other's voices in your argument. "Scientific networks are often so large that having each actor speak on his or her behalf…is often difficult," so it is more feasible to

have one actor represent the views of the network, just as Barton and Mann were entrusted to represent the views of their supporting networks throughout the controversy (Pg. 124).

Application of Venturini's Cartography of Controversies and Eisenhardt's Debate Management

A controversy starts when the actors involved are forced to work towards a solid compromise and can no longer ignore each other. In the case study of the congressional hearings, the central actors, Mann and Barton, were forced into interaction as soon as Barton requested information from Mann in his 2005 letter. This correspondence was the initial point of the controversy which stemmed from the fundamental article of literature, Mann's 1998 research paper (Besel, 2011). The research influenced the actions and intentions of every actor. Barton initiated a congressional hearing and connected opposing research and experts to testify against Mann's research. Mann later dedicated most of his life to fighting climate change denial and publishing a book on the issue (Wright, 2013). Despite the controversy being triggered by the same article of literature, it decomposed into two different arguments; Barton still argued the research methods were flawed, and Mann was later joined by his network to argue climate change is real and climate research should not be stunted. These questions were subsequently debated through the hearings, and the ensuing conflict did not see a clean end partially due to the resistance compromise or even agree on the questions causing the controversy.

Venturini established a framework for analyzing controversies, such as the arguments exhibited in the 2006 hearings, called the cartography of controversies in "Diving in Magma: how to explore controversies with actor-network theory" (Venturini, 2010). "The cartography of controversies is the exercise of crafting devices to observe and describe social debate especially, but not exclusively, around technoscientific issues." (Pg. 258). Venturini argued that controversies remain the best occasion to observe society and understand the network within it.

Much can be understood about people and society through analyzing how controversies are started and how people respond to them, "because [controversies] are the crucible where collective life is melted and forged: they are the social at its magmatic state" (Pg. 264). The cartography of controversies is a set of lenses to observe unbiased and not alter either the situation or peoples' viewpoints. Two of these lenses "from literature to actors," how textual statements including research influence human beings as actors, and "from actors to networks," how individual actors influence the collective around them, enable connections to be drawn between layers in a controversy especially in the evidence presented by Besel (Pg. 266). Through the "from literature to actors" lens, explicit relationships are drawn between the research Mann published and how it influenced Mann towards an increased awareness of climate change and Barton into investigating the findings in an attempt to dispute them. The "from actors to networks" lens is largely effective in understanding how the other climate scientists and lawmakers who support climate action came to defend Mann and his research. This framework is not intended to be used to obtain "the ultimate holistic viewpoint," but to rather switch or expand viewpoints on the controversy to increase observation about why the actors were influenced to avoid compromise (Pg. 265).

Controversies are debates, and to have a constructive debate, all actors involved must communicate effectively. Eisenhardt documents a sociotechnical framework for establishing and analyzing effective communication habits in "How Management Teams can have a Good Fight" (Eisenhardt, 1997). This STS method is an approach to conflict management that is designed to applied in either situations were communication needs to be improved or case studies where the communication failures can be investigated to improve future situations. Following the key steps and strategies outlined in Eisenhardt's work help the actors involved moderate their conflicts and

negotiations to ensure their conversations are productive in reaching an agreement. The framework from the "Good Fight" will be studied to better understand how the communication failures happened between those involved with the July 2006 hearings. The first tactic is for all actors involved to "focus on the facts" (Pg. 79). Concentrating on the current, objective data encourages people to focus on the problems and issues instead of any interpersonal conflicts. The second tactic is to create a variety of alternative options as this generates the opportunity for a larger debate as more potential solutions can be discussed. This is beneficial for two main reasons as it encourages people to think more creatively about solutions and starts a conversation between the participants. From these solutions, Eisenhardt encourages the actors involved to create common goals. Identifying the common goals all parties share is a significant beginning step in conflicts as it allows the parties to find issues that they all agree on and can more easily work towards to create momentum. When drafting the compromise or final decision, it is important for the actors to reach a consensus to create a sense of fairness. Balancing the power structure in a debate so that one voice does not outweigh the other also creates fairness in the decision-making process which allows for the outcome(s) to be more likely accepted. The bias or prejudice this creates between the actors breaks their trust in each other. Finally, Eisenhardt recommends to use humor, along with other methods, to relieve tension in the group and encourage the actors to engage with each other more. The goals of these communication tactics are highlighted in Figure 2. Applying this approach to Mann and the U.S

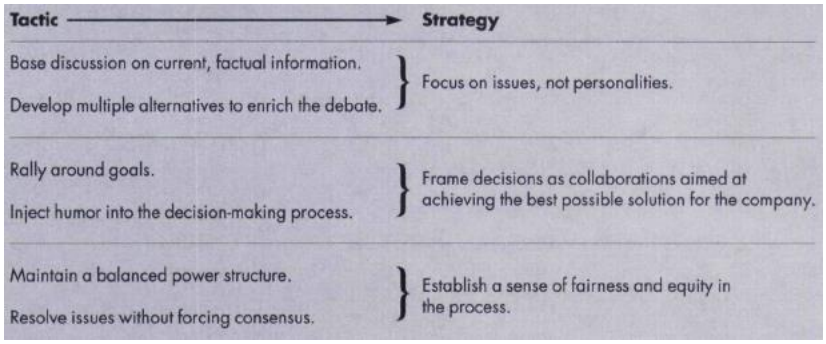

Figure 2. How Teams Argue but Still Get Along (Eisenhardt, 1997. Pg. 82)

Senators' interaction is appropriate, because it is a clear example of a conflict. Both sets of actors had their own goals and were in debate about the same issue of how, where, or if climate action should be enacted by the U.S. government. Eisenhardt's model can be effectively applied to their interactions to show how each key step could have been implemented to improve cooperation.

Direct Effects of Network Pressures on Climate-based Controversies and their Outcomes

Barton and Mann's Networks Heavily Influenced their Stances in the Controversy

The framework posed by Venturini allows for a deeper insight to what the actors intentions were throughout the controversy. For example, utilizing the various lenses in sequence enables us to see what influenced each actor and how it shaped their goals and actions. Figure 3 shows that literature can influence actors and actors can in turn influence networks. The influence most notable in the Mann versus Barton case study is the initial motivation for why Barton attempted to discrediting Mann's research, and how the publication of the research initiated the cascade of events resulting in the hearings. Applying the lenses to the work by Besel, Wright, and the documentation of the hearing highlights multiple potential influences that could have shaped Barton's view on climate change and how he would respond to it. First, Mann's research could have potentially received pushback from U.S. Senators, because they believed passing climate action to address Mann's report would be detrimental to their constituents by wasting taxpayer money and resulting in the loss of jobs. The cement businesses Barton was supporting in his district would have been more directly harmed than helped by environmental policies promoted by Mann's research. Environmental regulations would have hindered the businesses and kept money out of the local economies, hurting the people. The voices from these constituents

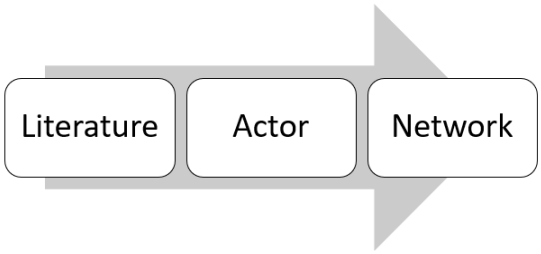

Figure 3. Influence Between Each of Venturini's Lenses

outweighed the influence of the research. In this scenario, the weight of the network connected to Barton overshadowed the literature-actor connection.

Second, Barton was also influenced by his network of peers as the House Energy and Commerce Committee Chairman, where his role is to assist with the regulation, oversight, and promotion of commerce and energy in the United States. In this role, he was also surrounded by others who worked closely with energy businesses that are typically harmed by environmental regulation. By taking a broader look at Barton's relations, not just to his constituents, but to his peers as well, it can be seen how he could have been further influenced to take a stance that limits climate action. Thus, the pressure from Barton's network of peers encouraged him to take their side in the conflict, just as they came to aid him throughout testimonials during the hearings. This pressure can also be observed through the literature-actor lens, as Barton, when presented with both pieces of literature, Mann's research and the critique in *Energy & Environment*, he chose to believe the critique and proceeded to use it in his argument against Mann's research techniques. Despite, the critique being unsupported by other journal articles with later proven unsubstantial claims, Barton still uses it to claim that the methods used Mann's peer reviewed research were scientifically inaccurate. From an unbiased view, Mann's research should have more influence as it has more credibility. However, the influence of Barton's network gave him a predisposed view and therefore position in the debate.

Unproductive Outcomes Caused by the Refusal of the Actors to Work Towards an Understanding

Through the July 2006 hearings, both Barton and Mann repeatedly did not follow the recommendations of Eisenhardt's framework. Mann primarily focused on the facts of his own research, and Barton "latched onto the [2003 *Energy & Environment*] report as sufficient reason to doubt" Mann's work, neglecting to overcome the interpersonal conflict (Besel, 2011, Pg. 121).

Both Mann and Barton stuck to their own facts and their main goals throughout the hearings, to prove or disprove the climate research respectively, without explicitly acknowledging other potential outcomes or offering to compromise (United States., Congress., House., 2006). This lack of effort resulted in both actors having little to no understanding of how to remedy the conflict. In addition, because Barton chose to investigate Mann's research in Congress, Barton did not set up the debate for all the actors to equally share the power, thus not encouraging Mann to try and reach a fair compromise. Finally, although there were no blatant, intentional uses of humor in the formal setting of a hearing in Congress, humor could have created more possibility for the actors to relax, compromise, and reach a common goal (United States., Congress., House., 2006).

The controversies discussed by Besel proved to be difficult circumstances to achieve proper communication as proposed by Eisenhardt. This is evident from the imbalance of power between actors, different questions being argued, and the inability to focus on the facts without letting personal conflicts interfere. Despite the lack of effective communication, this controversy could have been worthwhile, although poorly managed, if an agreement or understanding was reached by the end. However, no viable solutions were presented at the hearings for which all actors were willing to negotiate. As Barton initiated the hearings for the purpose of investigating Mann's research methods, he strongarmed Mann into a controversy Mann did not necessarily want to be in. This put Mann in a position with less power and leverage than Barton. Therefore, Mann was put at a severe disadvantage where if he tried to agree on new guidelines for research methods, his stance would have been overshadowed by Barton's. Unfortunately, creating new guidelines or more developed peer review standards could have been a successful step forward for both sides, as it would have given Barton and his network more confidence in future climate

research and enabled Mann and his network to convince more people of the importance of climate action.

Another potential outcome could have been to implement a plan for climate action that was negotiated between the actors. Enacting even a limited policy for climate action could make a significant difference in limiting global warming by acting immediately rather than years from that point. A limited policy would also not pose as substantial of an investment or lose to businesses and economies that would have been affected. The ratification of policy like this was hindered by Barton and Mann's inability to agree on what question was being debated. Had Mann understood that Barton was primarily attacking Mann's research, he could have focused the debate on proving his research methods were valid and focused less on arguing the climate change is real. On the other hand, had Barton realized that Mann was simply trying to argue climate change does exist and that it should not be ignored, Barton could have framed his argument to agree that climate change could exist but more research or research with more peer reviewed methods should be done. This could be due to both actors' inability to focus on the facts without letting personal conflict interfere.

Mann was brought into this controversy because his own research was being investigated and discredited, which could have appeared as a significant personal attack to Mann. Barton, again, could have been influenced by his role as the House Energy and Commerce Committee Chairman and by his constituents. Both personal conflicts may have inhibited the actors from fully working towards a compromise or effective discussion of potential outcomes. Mann would not have wanted any outcome where his research appeared to be false, and Barton would not have wanted any outcome where his constituents were hurt economically.

To improve how scientific controversies, specifically climate-based debates, are handled in the future the issues that lead to these controversies and the poor management of the controversies need to be better identified. This will allow the actors involved to better achieve consensus from a controversy and therefore action, whether for or against climate action. First, research and understanding in previous cases and sociotechnical analyses should be expanded. This would help better establish the direct effects of each communication and controversy ending techniques, and how each could be used to make climate debates more effective in the future. Not only does a better understanding of these controversies need to be developed, but climate scientists and politicians involved in the process of enacting climate change need to be better educated in these learnings. This will enable the actors to understand the main problems and how to handle them. Second, the actors involved need to focus on more explicit communication between each other, through their literature, and to their supporting networks. Specifically, by communicating about problems that arise and why each is a problem, the actors can more quickly overcome the issues as well as figure out with issues are one of the main problems or questions that need to be addressed. Clearly communicating about issues each actor faces builds onto the third way issues can be better identified; the actors from each side of the controversy need to explicitly state the questions they are debating and their objectives. This simple act would both serve as a conversation starter and enable each side to better understand what is being debated and how they can reach a compromise.

Conclusion

Neither the climate scientists nor the government officials fully attempted to understand the other's reasonings for their arguments in the congressional hearings over Mann's research. The pieces of literature and networks that supported Barton inevitably pushed him into arguing

his side so much so he did not attempt to reach an effective or reasonable compromise with Mann. Conversely, Mann's network did not help him try to understand Barton's objectives, so Mann had no external pressure to help Barton. The absence of effort between the two actors to work together, driven by this deficiency in network support, resulted in a lack of possible solutions to their controversy and continued cultural and congressional opposition towards climate action. This research suggests that by altering network and literature pressure on individual actors within a climate-based controversy, compromises and solutions to be reached more efficiently.

This paper only examines one specific controversy over climate change, and more should be analyzed to best understand communication failures in climate-based controversies. Collectively, each additional case study will expand upon our view of how networks and additional resources influence actors in different controversies, which will provide a more encompassing understanding. The implications from this research builds upon the layers of research that already exist about the actor network relationships by enabling future global warming controversies, such as those orchestrated in Congress, to be better mediated. For example, future actors can utilize these finding to more effectively work towards understanding the objectives and methodology of the other side while also learning to work towards suggesting potential solutions for the actors involved to compromise between. Further research and application of these techniques could help mediate other politically polarized controversies such as gun control or health care.

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