Climate Change, Still Challenged: Conservative Think Tanks and Skeptic Frames

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Abstract

Climate change "skepticism" continues to stymie the creation of meaningful climate change policy in the United States. Such skepticism arises, in large part, through organized counter-movements that challenge the legitimacy of climate change as a problem. Conservative think tanks – such as the Heartland Institute – continue to be key actors who disseminate skeptic frames to the broader public. Using a skeptic framing typology developed by McCright and Dunlap (2000), I assess online Heartland publications from September to December of 2013, providing a snapshot portrait of what think tanks in the United States are talking (and not talking) about. In this way I demonstrate the emergence of two key themes. First, the 2013 Heartland documents show an unexpected decline in the prevalence of frames that critique the economic implications of climate change policies. Secondly, the 2013 documents show a changing relationship between attacks on the scientific uncertainty of climate change versus the moral characters of those involved with mainstream climate research.

Paper prepared for the annual meeting of the Western Political Science Association
Las Vegas, NV, April 2-4, 2015.

1. Introduction

Environmental discourse in the United States is rife with conflict. In a country increasingly characterized by ideological divide, "contests over meaning are ubiquitous" (Dryzek 2005, 5). Such contests are particularly evident in the discourse surrounding global anthropogenic climate change. Despite widespread scientific consensus on the human-caused and deleterious nature of global warming, and the unprecedented rising of greenhouse gas emissions, meaningful political action remains precarious. In early 2015 alone, recent controversies have included such high-profile figures as Dr. Willie Soon (a prominent climate change skeptic scientist from the Harvard-Smithsonian Center for Astrophysics), revealed to have accepted more than $1.2 million from the fossil fuel industry, and Sen. James Inhofe (R-OK), (Chair of the Environment and Public Works Committee) who delighted America by tossing a snowball to the Senate floor in protest against the concept of anthropogenic climate change (Gillis and Schwartz 2015; Bump 2015).

Such climate change skeptics[2] and others – from prominent politicians, scientists, business leaders, media figures, and so on – contribute to widespread public uncertainty, misinformation, and confusion around climate change. Such opposition has successfully undermined the creation of progressive climate change policy, particularly at the national level (Rabe 2004; Hoffman 2011; Raymond 2014, in preparation), though regional developments – such as RGGI, the Regional Greenhouse Gas Initiative – offer some optimism for moving forward (Raymond 2014, in preparation),

As many scholars have noted, conservative think tanks and the conservative movement more broadly have played a significant role in generating uncertainty and doubt in the minds of the public regarding climate change (Oreskes and Conway 2010; Dunlap and Jacques 2013; Brulle 2013). Indeed, political party affiliation is one of the most reliable indicators of an individual's beliefs on climate change (Hoffman 2011; McCright and Dunlap 2011), and climate change has become as much a deeply wicked social and political problem as a scientific one.

While the burgeoning and interdisciplinary field of climate change communications explicitly acknowledges the role of "organized misinformation" in perpetrating uncertainty and stoking ideological divisions, less work has systematically sought to make clear how skeptic ideas and themes have changed through time – or how an understanding of such ideas can be more explicitly informed by counterframing theory. In this study, I apply and extend a climate skeptic theme typology developed by McCright and Dunlap (2000) "Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-Claims" to assess more recent climate skeptic frame development. In particular, I use McCright and Dunlap's typology to revisit climate skeptic frames as produced by the Heartland Institute, a prominent conservative think tank well known for its attention to climate change and other environmental issues.

[1] The author would like to thank the Purdue Climate Change Research Center for much-appreciated financial assistance, as well as Professor Leigh Raymond from Purdue University for his ongoing support.

[2] Given a spectrum of beliefs and attitudes toward the reality of climate change, labels of "skeptics", "deniers", or "contrarians" are used interchangeably or contested within climate communications literature. Despite "denier" potentially being more accurate, "skeptic" will be used here to more generally refer to individuals who contest the seriousness of climate change and the necessity of policy action.

My sampling frame encompasses the majority of climate skeptic materials reproduced on the Heartland website from September to December 2013. While some research contends that "the basic arguments have not changed since the early years of the debate" (Malone 2009, xi) a systematic assessment of 2013 climate skeptic frames reveals how frames have risen and fallen in prevalence. Most notably, my analysis highlights two major trends since McCright and Dunlap's 2000 assessment: First, a relative decrease in the presence of frames that see evidence for climate science as inherently uncertain, secondly, a decrease in the frame arguing that climate change policy would be economically ruinous, and lastly, an increase – and change of tenor – in the frame that identifies mainstream climate change research as "junk" science.

In this way, I begin to describe changing patterns in the climate skeptic frames that are most commonly accentuated by this facet of the conservative movement. Findings from my analysis inform a) the substantive development of climate change skeptic communications, and b) the role and impact of framing and counterframing within climate change discourse. Overall, these trends highlight the changing focus of climate skepticism in recent years – and suggest that the nature of skeptic discourse has become increasingly focused on a climate change "heterodoxy" frame that emphasizes the noble but victimized circumstances of skeptical climate change perspectives.

2. Prior Literature: Framing and Conservative Think Tanks

In the following section I provide overview of several key areas of prior research that inform my work. These include framing theory, content analysis research, and studies that explore the role and impact of conservative think tanks within climate change discourse.

Framing

One might frame a picture to draw attention to particular elements of the image over others, thus privileging or tapping into certain cultural narratives and storylines[3]. In doing so, frames define problems – but also implicitly or explicitly "diagnose causes…make moral judgements…and suggest remedies" (Entman 1993, 52). In this way, framing theory more generally suggests that how an issue is characterized will shape the way it is interpreted and understood by its audience (Scheufele and Tewksbury, 2007; Chong and Druckman 2007).

Within the context of climate change communications, recent research has more frequently emphasized the effects of frames in thought. This broad body of work focuses on topics such as gain versus loss frames, local versus global frames, and risk and uncertainty, for example. (Spence and Pidgeon 2010; Scannell and Gifford 2011; Weist et al. 2015; Morton et al. 2011). Overall, such work broaches the issue of climate change from a "climate realist" perspective, and is typically interested in how frames influence engagement with or attitudes toward climate change.

In contrast, significantly less work has explored frames in communication arising from skeptic materials. As McCright and Dunlap (2000) demonstrate, understanding the nature of climate change skepticism in itself is crucial in developing effective

communication strategies. Skeptic frames in communication challenge the notion that climate change is a problem at all. As Aklin and Urpelainen (2013) note, this kind of competitive framing is a typical component of public discourse, and has profound implications for the shaping of public opinion around often contentious issues (Nelson et al. 1997).

Systematic assessment of skeptic frames has more frequently occurred through content analysis research, in an effort to understand how global climate change is presented in various media outlets. Much of this research arises from communication, media, and journalism studies, where greater emphasis is placed on journalistic and cultural norms that mediate climate change coverage. Scholars have typically focused their attention on the analysis of mainstream traditional print media and high quality newspapers (Antilla 2005; Carvalho 2007; Poortinga et al. 2011), though other studies have categorized skeptic ideas in more non-standard print media, such as such as op-eds, editorials, and letters to the editor (Hoffman 2011; Young 2011; Elsasser and Dunlap 2013) as well as television (Boykoff 2008). In the case of popular media such as newspapers and television, existing research also shows how notions of "fair and balanced" reporting, as well as similar journalistic norms, have added gratuitous weight to skeptic claims and further contributed to the impression of legitimate debate or uncertainty around the causes and consequences of climate change (McCright and Dunlap 2000; Boykoff and Boykoff 2004; Boykoff 2007).

Ultimately, as Druckman and Chong highlight, framing should be understood as a process that evolves over time. As they note, "the dimension of time allows us to separate new issues from previously debated issues" (2007, 108).

Conservative Think Tanks

Within this framing battle, conservative think tanks have served a crucial role (Jacques et al. 2008), and a range of recent work has continued to highlight the part they play in fostering climate chance skepticism. Prior work has made explicit the substantial financial ties between conservative think tanks and fossil fuel industries (Brulle 2013), and the reach and influence of their publications: from books, op-eds, policy documents, and other forms of written media (Dunlap and Jacques 2013). In addition, conservative think tanks enjoy a privileged status in the media as "alternate academia", where they may be viewed as objective purveyors of truth and legitimate scientific work (Dunlap and Jacques 2013). Furthermore, conservative think tank representatives often achieve direct access to policy arenas when invited to testify at congressional hearings.

Climate change skepticism, as a movement, emphasizes inaction over action. That is, conservative think tanks such as Heartland can be understood as "resisting rather than promoting change" (Knight and Greenberg 2011, 326). As such, efforts to promote general uncertainty and doubt amongst the broader public form the core of the climate skeptic approach. This draws frequent comparison to the tobacco industry's earlier efforts to undermine scientific evidence that smoking was unhealthy (Oreskes and Conway 2010; Knight and Greenberg 2011). In this way, the frames produced by conservative think tanks continue to be exceptionally relevant for understanding and unpacking the shifting nature of climate change skepticism.

3. The Study

McCright and Dunlap (2000) performed content analysis on 224 conservative think tank publications produced between 1990 and 1997. Their original aim was to highlight the "counter-claim" endeavors of the conservative movement, which sought to undermine public understanding and perceptions of climate change as a serious issue deserving of policy attention. The study authors inductively created a mutually-exhaustive typology of 12 skeptic "frames", organized more broadly under three "counter-claims": the evidentiary basis of climate change is weak and even wrong, that climate change would actually be beneficial if it were to occur, and lastly, that climate change policies would do more harm than good (see table 1).

Table 1. Counter-claims defined: skepticism framing typology

Counter-Claim 1: The evidence for climate change is weak or wrong
F1. The scientific evidence for climate change is highly uncertain (nature of climate science is difficult to discern).
F2. Mainstream climate research is "junk" (unreliable, biased, illogical) science.
F3. The IPCC intentionally alters its reports to create "scientific consensus".
F4. Climate change is a myth/scare tactic produced and perpetrated by the vested interests of environmentalists and bureaucrats.
F5. Climate change is a political tool for the Obama administration/other democratic leaders.
Counter-Claim 2: If it were to occur, climate change would actually be beneficial.
F6. Climate change would improve human quality of life.
F7. Climate change would improve human health.
F8. Climate change would improve agricultural systems.
Counter-Claim 3: Climate change policies would do more harm than good.
F9. Proposed action would harm the national economy.
F10. Proposed action would weaken national security.
F11. Proposed action would threaten national sovereignty.
F12. Proposed action would actually harm the environment.

To date, little climate change communication scholarship has attempted to pick up where McCright and Dunlap's 2000 research left off. Given this, my goal is to apply the exhaustive 2000 typology to a more recent selection of climate change skeptic documents, and in doing so systematically discern how the framing approach of skeptic think tanks has or has not changed through time. In the following section I outline my own approach and strategies toward applying the McCright and Dunlap typology to a sample of Heartland institute climate skeptic documents from late 2013.

Sampling

Documents were collected through the Heartland Institute's official website, via the organization's built-in search engine, "PolicyBot". PolicyBot organizes online documents published by other American free-market think tanks and advocacy groups, as well as indexing Heartland publications. Given this, Heartland serves as an appropriate clearinghouse for accessing skeptic documents. This is an especially reasonable sampling

strategy given Heartland's position as one of the most prominent climate skeptic organizations (Gillis, 2012) and as one of the most high-impact think tanks in terms of shaping public policy in the United States (McGann 2014). While not exhaustively capturing the population of climate skeptic documents generated during the sampling time frame, it is appropriate to assume that this sample captures the majority of climate skeptic documents – and certainly the most significant ones – generated during the sampling time frame.

Documents were gathered using "climate change", "global warming", and "greenhouse gas effects" as search terms, in remaining consistent with the original typology. Documents were then initially screened to assess whether they were climate change skeptic or not. A document was considered climate change skeptic if it explicitly undermined at least one of four major concepts: the existence of global climate change, the negative impacts that climate change poses for human and natural systems, the human-induced reality of global climate change, and lastly, its unprecedented nature (that is, global levels of carbon dioxide emissions are higher than they have been for many thousands of years). For example, a document describing 2013 as the mildest tornado season in decades would only be included in the sample if it made direct reference to mild tornado seasons as evidence against global climate change.

McCright and Dunlap's (2000) original sampling frame spanned from 1990 to 1997, and included a total sample of 224 publications. Given the tremendous growth of Internet communications, and in light of time constraints, this study used a truncated sampling frame spanning from September to December of 2013. Due to time constraints, full-length books were also excluded from the sample, leading to the exclusion of two documents. Overall, these search parameters led to an eventual sample of 102 documents.

3.2 Coding

108 Heartland publications were coded and analyzed during the winter of 2015. Each document was subjectively coded for the presence or non-presence of each skeptic frame outlined by McCright and Dunlap (2000) in their original inductive typology (table 1). Every document could potentially contain all 12 frames, though text segments could not be coded as representative of more than one frame. Dedoose, a software application for qualitative and quantitative content analysis research, was used to streamline the coding procedure and better ensure systematic consistency in coding decisions, however, manual coding was still used to best attain the flexibility necessary for novel frame analysis (Chong and Druckman 2007). Documents were coded with frequent reference to McCright and Dunlap's original typology to ensure adherence to the original substantive meaning of each frame and avoid conceptual stretching. At the same time, an inductive approach allowed for novels frames to be highlighted which may not have been accurately captured or non-existent in McCright and Dunlap's original typology. Moving forward, this research will incorporate intercoder reliability measures to ensure to ensure that coding is consistent and objective.

McCright and Dunlap (2000) note that, leading up to the Kyoto Conference, think tanks began producing greater numbers of documents than in previous years – but documents that were shorter and of a more persuasive nature. McCright and Dunlap interpret this as indicative of the conservative movement having "stepped up mobilization

efforts to challenge the legitimacy of global warming as a problem" (509). The trend toward shorter publications has continued, which is also unsurprising in the contemporary context of ubiquitous Internet use and a reliance on online sources of information (Sunstein 2009), a form of media that favors brief publications.

Along this same vein, 2013 Heartland publications resist the kind of clear-cut organization found in McCright and Dunlap's 2000 work. Documents are widely varied and frequently geared toward online consumption, making the "type" categories described by McCright and Dunlap unhelpful. Documents can instead be categorized as "weekly wrap-ups", links to scientific journal articles, formalized policy documents (most frequently produced by the Heartland-associated "Nongovernmental Panel on Climate Change"), or more general short and persuasive articles akin to a traditional op-ed format.

4. Results: Climate Change Frames in Application

Table 2. Conservative think tank counter-claims on climate change

		2013		*1990 - 1997*	
Frames	*Description*	*N*	*%*	*N*	*%*
Counter-Claim One *The evidentiary basis of climate change is weak and even wrong.*		124		159	
1	The scientific evidence for climate change is highly uncertain.	34	**31.8**	141	**62.9**
2	Mainstream climate research is "junk" (unreliable, biased, illogical) science.	56	**52.3**	30	**13.4**
3	The IPCC intentionally alters its reports to create "scientific consensus".	12	**11.2**	16	**7.1**
4	Climate change is merely a myth or scare tactic produced and perpetrated by the vested interests of environmentalists and bureaucrats.	17	**15.9**	41	**18.3**
5	Climate change is a political tool for government leaders.	5	**4.7**	31	**13.8**
Counter-Claim Two *Climate change would be beneficial if it were to occur.*		45		30	
6	Climate change would improve human quality of life.	13	**12.1**	10	**4.5**
7	Climate change would improve human health.	6	**5.6**	10	**4.5**
8	Climate change would improve agricultural systems.	26	**24.3**	20	**8.9**
Counter-Claim Three *Climate change policies would do more harm than good.*		28		139	
9	Proposed action would harm the national economy.	18	**16.8**	130	**58.0**
10	Proposed action would weaken national security.	0	**0**	4	**1.8**
11	Proposed action would threaten national sovereignty.	5	**4.7**	9	**4.0**
12	Proposed action would actually harm the environment.	5	**4.7**	7	**3.1**
	*Total frame count**	188		308	

*The 2013 analysis contained a total of 102 documents, while the 2000 analysis contained 224. Because each document can contain multiple frames, frame counts are higher than the total number of documents.

4.1 Counter-Claim One: No Evidence for Climate Change

Counter-claim one is comprised of five frames that challenge the evidentiary basis of global warming as weak or wrong, thus "undermin[ing] its credibility in the eyes of the public" (McCright and Dunlap 2000, 511). McCright and Dunlap originally observed that

71% of documents contained at least one of these five frames, making it by far the most dominant skeptic theme. Of these five, the most prevalent frame identified was that climate change is associated with high scientific uncertainty – that climate science itself is fundamentally uncertain (F1). They note that documents portraying this frame depict climate science as "contradictory", "flawed" and "murky" (511). Such publications challenge the idea of scientific consensus, and otherwise highlight the variability and unknowability of natural cycles. Climate change is not only uncertain, but is also definitely not occurring. For example:

> There is also no link between global warming and extreme weather, but there is a powerful correlation between global warming and variations in solar output and ocean cycles. Sunspots have historically matched both warming and cooling, and we now are in for a cooling (Science Taking Back Seat to Political Correctness).
>
> The extent to which the warming in the last two decades of the twentieth century was man-made and the likely extent of any future warming remain highly contentious scientific issues (Consensus? What Consensus?).
>
> Other scientists contest the IPCC assumptions, on the grounds the climatological effect of increases in atmospheric carbon dioxide is trivial and the climate is so complex and insufficiently understood that the net effect of human emissions on global temperatures cannot be forecasted (The Science Fiction of IPCC Climate Models).

In the 2013 Heartland publications, this frame of scientific uncertainty appears in 31.8% of documents, compared to 62.9% of documents as seen in McCright and Dunlap (2000). Put simply, this suggests that climate skeptic discourse is moving away from this frame as a communication device. For those publications that do stress the uncertainty of climate change, the concept of "no warming for 15 years" makes up a significant component of this frame in action:

> The global temperature has not risen for at least the past 15 years (Research & Commentary: Temperature Observations).
>
> Global temperatures stopped rising 15 years ago despite rising levels of carbon dioxide, the invisible gas the IPCC claims is responsible for causing global warming (Panel of Scientists Says UN Study Retreats, Misleads, and Misinforms).

While F1 suggests there is little or no evidence for climate change – or that the problem is merely too complex to be sure – the second frame, F2, "question[s] the credibility of mainstream climate research" (511) itself, and attacks the credibility of mainstream climate research. This frame, somewhat more accusatory and aggressive than F1, appeared in 13.4% of McCright and Dunlap's sampled documents. While F1 has decreased in prevalence since the 2000 study, this research suggests that F2 has become an increasingly popular counter-frame in recent years. Indeed, it appears in just over half (52.3%) of sampled publications. While often focusing on criticisms of climate models, this frame more broadly portrays climate research as suspect and corrupted by the hidden agendas of mainstream climate scientists or environmental activists. The following excerpts illustrate this:

> The SPM [the Summary for Policy Makers from the Intergovernmental Panel on Climate Change] claims that globally averaged surface temperatures show a linear warming trend over the period 1880 to 2012. This is a cherry-picked interval, used to give a false impression of a steady, continuous warming (Non-governmental (NIPCC) climate scientists critique the UN's IPCC).
>
> Needless to add, support of global warming alarm hardly constitutes intelligent respect for science (Understanding the IPCC Climate Assessment).

McCright and Dunlap (2000) initially conceived of this frame as one that broadly attacked the "credibility of mainstream climate research" (511). They distinguish between two threads of this frame: first, that climate models are biased or generally untrustworthy, and two, that climate scientists themselves are "suspect because of a supposed hidden agenda" (511). The 2013 Heartland documents indicate a dramatic increase in this frame's overall prevalence. Most interestingly, the frame's latter thread – which directly attacks the motives of climate researchers themselves – makes up a significant component of this frame's presence. Indeed, the Heartland documents attack not only mainstream climate researchers, but mainstream media and social scientists as well more broadly.[4]

A third frame in this counter-claim specifically targets the IPCC as a corrupt organization struggling to maintain, as one document puts it, a "house of climatic cards". Like F2, F3 more aggressively questions the legitimacy of mainstream climate science, yet it specifically draws out the duplicity of the International Panel on Climate Change (IPCC) in intentionally altering its reports. McCright and Dunlap note the frame occurring in 7.1% of publications, as compared to 11.2% in the 2013 documents. This increase makes sense in light of the 2013 sampling frame, which includes the publication date of the IPCC's fifth assessment report – making it a particularly salient focal point for skepticism discussion. In addition, the Heartland Institute houses the NIPCC (Nongovernmental Panel on Climate Change), an organization that views itself as an independent auditor of the IPCC. Overall, this frame emphasizes the IPCC's nature as an intergovernmental organization, and stresses that the politicized group has little capacity for unbiased research. This is demonstrated in the excerpts below:

> The Humpty Dumpty-esque report once claiming to represent the "consensus of scientists" has fallen from its exalted wall and cracked to pieces under the burdensome weight of its own cumbersome and self-serving processes, which is why all the governments' scientists and all the governments' men cannot put the IPCC report together again (Band-Aids Can't Fix the New IPCC Report).
>
> "Why should we believe what the IPCC predicts, given the model prediction/projection failures, plus manipulation of the data, plus hiding of data, plus false claims that those preparing IPCC reports are experts, plus Climategate in general, plus Glaciergate?" asked Laurence Gould, professor of physics at the University of Hartford, a chapter peer-reviewer for the NIPCC report (Panel of Scientists Says UN Study Retreats, Misleads, and Misinforms).

A fourth frame (F4) describes how climate change is a myth perpetrated by environmentalists and bureaucrats, especially as a means of meeting their own vested interests. McCright and Dunlap identified this frame in 18.3% of publications analyzed, compared to 15.9% in the 2013 Heartland documents. A significant component of this

[4] Indeed, one Heartland document also mentions McCright and Dunlap's 2000 article in this context.

frame highlights the fear-based use of climate change as a tool for pursuing the radical environmentalist agenda. Many F4 manifestations argue that environmentalist claims should not be taken seriously because environmentalists use global warming to pursue their own financial interests. McCright and Dunlap comment, "documents containing this theme tend to involve more name-calling than actual scientific discussion" (512). Over a decade later this remains true, with frequent pejorative references to "alarmists" and the "doomsday crowd". The U.S. Environmental Protection Agency also appears as a specific target in this frame:

> The report was welcomed by environmental advocacy groups and other interests that benefit from public anxiety over the prospects of catastrophic climate change (PricewaterhouseCoopers' "Too Late" Report : Poor Science, No Practical Solutions).
>
> Crockford says this study casts doubt on gloom-and-doom predictions about the demise of polar bears by proponents of alarm over manmade global warming (Chukchi Polar Bears Thriving as Arctic Ice Recedes).
>
> As time progressed and more scientists became associated with universities, funding for their work became important. Political opportunists entered the scene, along with fringe groups that could find an avenue for their cause, such as environmental activists and the alarmist global warming scam (Science Taking Back Seat to Political Correctness).

The final frame in the "weak evidence" counter-claim is the notion that climate change serves as a political tool for government leaders. F5 implicates the political leftist administration in a wider conspiracy. Like F4, this is seen as a method of securing economic gain, but also as a means of controlling the American population at large and selectively advancing its preferred policies with a veneer of scientific legitimacy. In the 2000 study, this frame occurred in 13.8% of publications, compared to 4.7% in the current study. Ex-vice-president Al Gore remains an occasional target in this frame, while President Barack Obama is more commonly referenced, especially claims as to Obama's "war on coal" and "war on global warming". For example:

> SCC [Social Cost of Carbon] estimates are extremely malleable, Murphy testified, because they depend on highly subjective modeling assumptions which can allow government agencies to produce studies justifying whatever policy they desire (White House's Social Cost of Carbon Estimates Questioned).
>
> Since the war on global warming is a high priority within the Obama administration, finding ways to make the social cost of carbon appear to be as high as possible is the ongoing objective (Obama's 'Social Cost of Carbon' is at Odds with Science).

Through these five frames, the climate skeptic movement discredits and undermines the scientific evidence surrounding anthropogenic climate change as a serious problem in need of attention. The scientific evidence for climate change is: either uncertain or demonstrates that warming is not occurring (F1), is "junk science" that aggressively attacks any who disagree with its conclusions (F2), is headed by the IPCC, an organization that doctors its research to create the illusion of consensus (F3), is an overdramatized scare tactic pushed by bureaucrats and environmentalists (F4) or serves as a political tool for government leaders (F5). As seen in McCright and Dunlap's earlier assessment of conservative think tank publications, this collection of frames continues to

dominate climate skeptic publications in late 2013.

4.2 Counter-Claim Two: The Potential Benefits

While the climate skeptic movement argues that scientific evidence for anthropogenic climate change is lacking, it also – and conversely – contends that global climate change would bring about substantial benefits. This group of three frames is considerably less common than the first five, appearing in only 45 of the publications assessed in 2013. However, this does show an increase from McCright and Dunlap's 2000 analysis, where this collection of frames appeared in only 30 documents, or 13.4% of their sample. As the reality of human-caused climate change becomes more firmly established in the public imagination, it does seem expected that the countermovement would turn its focus from explicit denial, and invoke instead more nuanced frames that obscure the serious consequences and costs of climate change.

The first frame of this set suggests that climate change would generally improve human quality of life (F6), while the second more specifically emphasizes improvements to human health (F7). F6 highlights "day-to-day" improvements to well being, such as enjoying warmer temperatures, lower heating bills, and more moderate weather overall:

> Global warming has so far cut heating bills more than it has raised cooling bills (Yes, Warming is Benefiting Human Welfare).

Alternatively, F7 focuses on the direct health benefits brought about by a warming world. The six publications including this frame made generalized claims about improved health, but offered little in the way of more specific argumentation:

> Recent global warming…has actually helped to reduce temperature-related deaths, not only by the means described in this study, but also due to the fact that extreme cold yearly kills far more people than extreme heat (Declining Diurnal Temperature Range Increases Human Longevity).

Other documents within this second counter-claim contend that climate change is a significant boon to agricultural production. As the most common frame in the set, this argument appears in 26 of the 2013 publications (24.3%), while making only 20 appearances (8.9%) in the original study. The content of this frame has also dramatically expanded since McCright and Dunlap's initial research: climate change is not only useful for human civilization via increased crop production, but would also bring about serious benefits for the natural world and ecological systems. This is an unexpected shift in focus from instrumentalist benefits toward intrinsic appreciation for the natural world:

> It appears that atmospheric CO2 enrichment likely will not lead to a degradation of planktonic food quality in Arctic waters, in contradiction of what many environmental pessimists have ardently postulated (Ocean Acidification's Impact on Planktonic Community Fatty Acids).

This reframing of climate change as beneficial to natural systems is especially obvious in the consistent portrayal of carbon dioxide as strictly vital for all life and earth – the more, the better. This sentiment is particularly seen in the indignant portrayal of carbon dioxide as plant food, not pollution, and as "the basis for all life on earth". Instances of this frame focus attention on environmentalists' "vilification" of the

"invisible and harmless gas". The refrain, "CO2 is plant food!" typifies this frame in practice. These excerpts exemplify these ecological and economic benefits of increased carbon dioxide:

> The value of global food production has increased by $3.2 trillion as a result of our carbon dioxide emissions (Obama's 'Social Cost of Carbon' is at Odds with Science).

> The more CO2 there is in the air, the better plants grow, as has been demonstrated in literally thousands of laboratory and field experiments. And the better plants grow, the more food there is available to sustain the entire biosphere (Carbon Dioxide Emissions Stimulating $15 Trillion in Crop Production).

In summation, this frame attempts to make light of supposed negative consequences of climate change, and instead portrays outcomes as positive opportunities for overall human well being – and, more recently, for ecological systems as a whole. The growing prevalence of this frame set suggests that it is experiencing growing traction and salience amongst the climate skeptic movement.

4.3 Counter-Claim Three: Action Causes More Harm than Good

Lastly, counter-claim three argues that proposed action to mitigate the effects of climate change or address its causes would prove more harmful than beneficial, particularly on a national scale. This counter-claim is composed of four distinct frames, and was present in 28 of the 2013 Heartland documents – a considerable and puzzling decrease from the 130 (58.0%) instances identified by McCright and Dunlap.

The first frame, F9, argues that the United States economy would suffer under proposed mitigation efforts. Given the usual connotations between conservative ideology and high valuation of free-market economies, this connection is not at all surprising. Statements such as "proposed 'remedies' would be economically devastating", and "this is a matter of life and death for the U.S. economy" effectively capture the seriousness in which this frame is communicated. This frame is closely aligned with earlier frames that undermine the credibility of mainstream climate scientists, in that "alarmists" carelessly waste taxpayer funds in the pursuit of their ideological pet projects:

> For the past decade, billions of dollars have been spent in an effort to fight climate change (Climatism - Driving Federal Government Policies).

> "Oil and gasoline are used in transportation vehicles precisely because they are less expensive than alternative fuel sources," said Heartland Institute science director Jay Lehr. "Reducing carbon dioxide emissions by punishing inexpensive energy sources is only going to hurt California consumers (Federal Court Blocks California Carbon Emissions Rule).

In addition, the 2013 Heartland publications also indicate a more novel manifestation of the claim that climate change policies would do more harm than good. While F9 suggests that the United States would suffer economically under international climate change treaties, a more specific aspect of this frame highlights that any attempts to curb emissions naturally would be meaningless without cooperation from big-time greenhouse gas emitters like India and China. This "action is meaningless" frame is exemplified by the statement that explains:

> "China emits more carbon dioxide than the entire Western Hemisphere. If the U.S., beyond merely freezing the level of its emissions, fully eliminated all carbon dioxide emissions today, the mere growth in Chinese emissions over the next 10 years would more than compensate for the complete elimination of U.S. emissions" (U.S. Carbon Dioxide Emissions Remain Below 2000 Levels).

Thus, American efforts to reduce greenhouse gas emissions would not only be economically costly, but thoroughly futile as well – what might be understood more broadly as a "collective action problem" frame.

Another frame that highlights the potentially deleterious impacts of climate policies suggest that any international treaties would endanger national security (F10). In their 2000 publication, McCright and Dunlap noted their own infrequent encounters with this frame: only four instances, appearing in a mere 1.8% of their sampled documents. This same observation holds true in the 2013 publications where the national security frame made no appearances whatsoever. As McCright and Dunlap note, this small number of observations is surprising given the conservative movement's typical emphasis on strong national defense.

An additional absent frame from this set argues that proposed action on climate change would threaten action would threaten the sovereignty of the United States (F10). This frame is non-existent within the 2013 Heartland publications, and appears nine times (4.0%) in McCright and Dunlap's original analysis. This sovereignty argument connects to previously described frames that warn of conspiracy amongst liberal elites and the creation of global government.

Lastly, the final frame from this counter-claim set suggests that climate change action would have a detrimental effect on the actual environment itself, the very thing such action would be purporting to support. Within these data sets, this frame appeared only five times (present in 4.7% of sampled publications), as compared to nine times (4.0%) in the 2000 study. Thus, the frame again appears to be one that garners minimal traction. Overall, the frame emphasizes the shortsightedness of policies meant to address climate change, in that the policies create even more serious environmental burdens:

> For example, U.S. wind turbines, while providing less than 3 percent of the nation's electricity, kill at least 1.4 million birds and bats—including many endangered species—every year (Research and Commentary: Social Cost of Carbon).

> The large environmental activist groups are heavily funded by the renewable energy lobby, which explains why they turn a blind eye to the very real environmental harms caused by wind and solar power (Environmental Activist Naomi Klein Slams Joe Romm for Ignorance, Hatchet Tactics).

Overall, I find that several major shifts in frame production have occurred since McCright and Dunlap's 2000 publication. These changes are summarized as follows:

- Climate skepticism may be moving away from highlighting the scientific uncertainty of global climate change's existence, though the concept of "no warming for 15 years" is ubiquitous.
- Instead, documents emphasize the nature of mainstream climate science as over-politicized and "junk" science; a "groupthink orthodoxy" that is coercive to dissenting voices.

- Less emphasis on climate change as a tool for specific political leaders.
- A rising emphasis on the beneficial nature of climate change, especially in terms of agricultural developments, where more CO2 means larger and healthier harvests for the benefit of humanity: the unquestioning notion that “CO2 is plant food”.
- More specifically, recent think tank publications stress that climate change would be beneficial for the environment and natural ecosystems as a whole. This frame, which emphasizes the intrinsic value of species diversity and the beauty of the environment, seemed entirely absent from the 2000 study.
- Frames that highlight the detrimental nature of proposed climate change policies have, collectively, decreased since the 2000 study. The frame that highlights economic costs to climate change policy action has experienced a particularly dramatic decrease. This is surprising given the importance that conservative ideologies place on economic performance.

5. Discussion

A content analysis examination of think tank frame output is an integral chapter in the ongoing story of climate change in the United States. Environmental issues – and climate change as the most prominent figurehead among these – have become deeply partisan, demonstrative of the wider and intense ideological cleavage that dominates political life in the United States. Conservative think tanks like the Heartland Institute are thought leaders able to create and circulate the frames that shape how conservatives consider and challenge the legitimacy of climate change as a serious environmental problem. My analysis of the Heartland Institute's climate skeptic frames provides a snapshot portrait of what think tanks in the United States are talking (and not talking) about. Within my assessment of the 2013 Heartland documents, two key themes begin to emerge. First, the 2013 Heartland documents indicate an unexpected decline in the prevalence of frames critiquing the economic implications of climate change policies. Secondly, the 2013 documents show a changing relationship between attacks on the scientific uncertainty of climate change versus the moral characters of those involved with mainstream climate research. I discuss these themes in the following section.

5.1 Changing Economic Emphasis and the IPCC Report

The 2013 Heartland analysis indicates a surprising decrease in the “economic harm” frame: that is, that any policy to address climate change will do major economic damage. Current research suggests that economic frames – stressing the highly undesirable potential economic costs of climate change policy – should be particularly salient as a climate skeptic theme. Climate change skepticism is closely linked with conservative and right-wing ideologies: those that historically value free-markets and economic development (McCright and Dunlap 2000).

Given these historical connections between conservative ideologies and economic benefits, this is a surprising result. What can explain this dramatic shift?

Part of this may be attributable to the time frame from when the 2013 documents are sampled. The Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment

Report (AR5) was released in late September of 2013. This was a much-anticipated and major focusing event on the physical science evidence for climate change, particularly given that the last report of its type was released as far back as 2007 (Pearce et al. 2014). Thus, it may be that my selected sampling frame coincides with an invigorated focus on the scientific legitimacy of climate "alarmist" claims as opposed to the policy implications of meaningful climate action. Thus we might expect that counterframing efforts would accordingly focus on lambasting the science and scientists of mainstream climate research.

5.2 The Climate Change Heterodoxy: Forget the Science, Get the Scientist

However, beyond the particularities of my study sample frame, a larger shift within climate change discourse emerges from the 2013 data. In contrast to McCright and Dunlap's 2000 data, the 2013 Heartland documents show a strong emphasis on the idea of mainstream climate change science as "junk". While the F2 "junk science" frame has becoming more prevalent, F1 – that "the scientific evidence for climate change is highly uncertain" – has decreased quite dramatically since the 2000 study. While both frames contend that the evidence for climate change is uncertain, the first focuses on the complex nature of the natural world as the cause for uncertainty, while the second highlights scientists' motives and questions their moral character. While frames that attack the legitimacy of climate change science are still the most prevalent in the 2013 Heartland data, a redistribution of frame prevalence is quite clear within this counter-claim category. In 2000, McCright and Dunlap remark that the F2 frame had become "particularly strategic in recent years as it accompanies the conservative movement's claim that it has aligned itself with 'sound science'" (512).

This portrayal has not only intensified, but also taken on a new tenor of righteous indignation or victimhood. Mainstream climate scientists are purveyors of poor-quality science – while liberals and environmentalists in general are anti-science, suffering from the "liberal knowledge gap" as well as groupthink and alarmism. This aspect of the frame thus argues that anyone who challenges mainstream science becomes a victim and target for the established orthodoxy, both from established climate science but also the mainstream media. This specific aspect of the F2 frame criticizes the liberal perversion of science, and situates climate skeptics as victims subject to smear campaigns. The following examples highlight this changing emphasis of the frame:

> This is typical of how professional environmental activists respond to the science, as well. When scientific evidence calls their alarmism into question, they launch personal attacks against those who present the science. It is a disservice to science when people respond that way (Environmental Activist Naomi Klein Slams Joe Romm for Ignorance, Hatchet Tactics).

> It's a David versus Goliath battle, and the skeptics are clearly the "Davids" in this fight (Heartland Replies to Greenpeace's Dealing in Doubt).

> Forecast the Facts campaign manager Brad Johnson is ramping up a hate campaign against people who are skeptical of climate alarmism, calling them "evil" in a media statement. Johnson's hateful rhetoric merely continues a pattern of hate poured out by global warming alarmists directed at people who disagree with their scientific views (Forecast the Facts Calls People "Evil" for Disputing Alarmism).

In their 2011 study of Canadian climate change skepticism, communication scholars Knight and Greenberg note that skeptics frequently perceive themselves as victims: mainstream climate scientists portray themselves as the only legitimate purveyors of climate knowledge, and, as a result, climate skeptics then perceive themselves as the targets of personal attack. These nuances were similarly noted in the 2013 Heartland documents. Personalized attacks of this nature are a manifestation of contested "reputational politics", where climate realists and skeptics are "locked together in a process of reciprocal discrediting and denunciation as they attempt to marginalize and de-legitimize one another" (Knight and Greenberg 2011, 327).

Indeed, in more recent media, this frame is perfectly demonstrated by presidential hopeful Ted Cruz and a recent media appearance with the Texas Tribune. In the March 24, 2015 interview, Cruz discussed climate change and drew parallels between Galileo and climate change skeptics: "Today, the global warming alarmists are the equivalent of the flat-Earthers" (Bump 2015b).

These findings on the rise of personalized attack prior work on climate change communications has stressed the importance of scientific consensus around climate change as an issue. That is, communications scholars have noted that broadcasting the scientific consensus of climate change is a crucial endeavor in gaining public support for climate change policy. Yet findings from the 2013 data indicate that the “scientific uncertainty” battle over climate change has become less important in the past decade or so. This may signal that the battle over scientific consensus is over (and won) or it could mean that emphasizing the consensus around climate change is a less important debate than many communicators believe.

However, the frames that we do see tell only part of the story. Frames that are missing – and which we might reasonably expect to see – are just as noteworthy. “Natural cycles”, a scientific evidence frame (highlighting the futility of human action in shaping global climate conditions) as well as “economic injustice”, a policy frame (highlighting that climate change policies would hurt and further marginalize the poor). Prior research has underlined the importance of “natural cycles” in the public’s understanding of climate change. For example, Conwood and Higginbotham (2013) discuss the prevalence and importance of the “natural cycles” frame in a layperson understanding of climate change. As the authors note, this sentiment is commonly understood as the idea that “humans are not responsible for the weather nor can they control its vicissitudes” (1859). Despite an expectation that concept should be widespread – a common armament in the climate skeptic’s arsenal – neither of these frames appears within the 2013 Heartland documents with any regularity.

Results presented here are best considered as a snapshot-in-time portrayal of climate skepticism. In future development of this research, I intend to extend my sampling time frame and achieve a more widely representative understanding of climate skeptic frames in action. In addition, research exploring the dynamics of online climate change skepticism will also be critical. Indeed, this would seem particularly important given the ubiquity of the Internet. While vitriolic skeptic discussion is becoming more rare in mainstream media outlets, research suggests that “new media” and online communication environments are becoming increasingly important sites of climate skeptic frame production and dissemination (O’Neill and Boykoff 2011; Sharman 2014).

6. Conclusions

Large-scale climate change policy remains elusive in the United States, and an organized countermovement of climate change skepticism has been widely successful in preventing the adoption of meaningful policy at the national level (Skocpol 2013). As such, it is crucial to understand how key climate skeptic thought leaders describe and "delegitimize" climate change as a serious problem. In this study, I systematically assess publications from the Heartland Institute – from September to December of 2013 – creating a thorough snapshot of how some of the most influential skeptic leaders talk about climate change. In this way I illustrate the range of "culturally available frames" (Gamson and Modigliana 1987, 144) that make up the body of climate change skeptic discourse.

In doing so, I demonstrate several particular insights of interest. While the majority of skeptic documents still contain frames that highlight the weak evidence for climate change, skeptic documents now focus, with considerable intensity, on the idea that the legitimacy of mainstream climate research is questionable: that it is "junk" science. More importantly, the frame has begun to be characterized by a new tenor of victimhood and the idea that mainstream climate science is oppressive. In this way, climate skeptics portray themselves as victims to the orthodoxy and the true purveyors of "sound" science. An attention to framing helps researchers understand more precisely how people "locate, perceive, identify, and label" (Goffman 1974, 21) events and issues, and more specifically, how these kinds of interpretative actions shape the way that people think about the possible solutions to policy problems.

The dynamic of framing and counterframing should not be underestimated by policymakers and professional environmentalists. As environmental political scientist John Dryzek notes, "the way the issue is dealt with depends largely… on the balance of these competing perspectives" (2005, 8). From a counterframing perspective, these changes in concept prevalence suggest that climate skeptic discourse may be changing its fundamental framing strategy. By mirroring – albeit in a twisted sense – the values and motivations of science, freedom of speech, and intrinsic environmental well-being, In this way climate skeptic discourse fulfills an expectation of counterframing, whereby "each side has the potential to draw voters away from its opponents using frames for its own position that may also appeal to the other side's voters" (Chong and Druckman 2007, 114).

Despite frequent admonitions that climate change communicators should stress frames that those on the ideological-right would be more sympathetic toward, such perspectives underestimate the strength and staying-power of opposition to any form of climate change policy. Frames that capitalize on solutions "inimical to the everyday values and economic concerns of ordinary American families" (Skocpol 2013, 10) must do so in a way that are still attuned to the changing tenor of climate change skeptic discourse. This remains especially true for professional environmentalists and policymakers interested in supporting progressive climate change policy in the United States.

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