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Framing Reality: Portrayals of Climate Change in the "Las Vegas Review-Journal", 1997-2014

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FRAMING REALITY: PORTRAYALS OF CLIMATE CHANGE IN THE *LAS VEGAS REVIEW-JOURNAL*, 1997–2014

by

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ABSTRACT

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by

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Discussions of human-caused climate change have become an increasingly salient artifact of various media in recent years. With regard to print media in particular, scholars have uncovered general increases in the frequencies with which climate change articles are published, tantamount to the annual reports from the Intergovernmental Panel on Climate Change (IPCC) advocating the detriments of human activities (particularly carbon dioxide emissions) on the natural environment. Among such reports—be they scientific or anecdotal—writers and journalists have had to interpret the ongoing discussions and evidence surrounding climate change, and develop schemas (or *frames*) in which to situate arguments. These arguments have taken various forms and have extended beyond the binary notions of being entirely supportive or oppositional to the existing scientific evidence advanced by the IPCC. In turn, scholars have developed myriad approaches for studying the phenomena of climate change portrayals, both in terms of analyzing content and attitudinal effects on audiences.

Following the direction of previous scholars, this study examines portrayals of climate change from a regionally distributed publication situated in the desert southwest: the *Las Vegas Review-Journal*. Given the environmental precariousness to which Las

Vegas, NV has been exposed in recent decades—particularly with regard to extreme, prolonged drought and infrastructural issues pertaining to water distribution (Brean, 2013; Futrell, 2001; Holthaus, 2014; Shine, 2014)—this analysis uncovers the trends of particular frames engaged to communicate climate change among 1,111 articles between 1997 and 2014. Specific frames include the *attribution of responsibility* frame, *human interest* frame, *conflict* frame, *morality* frame and *economic consequences* frame. Additional factors, such as discussions of geographic areas, authorship patterns across various types of articles, and placement patterns of articles in the physical newspaper, are also considered. Overall, this study found discussions of conflict and economic consequences to appear with greatest magnitude amid frequent references to Southern Nevada specifically. Amid generally increasing frequencies of article publications, climate change articles remained moderately visible with regard to placement in the physical newspaper, as almost all articles were situated on pages succeeding the first page (A1) and within the second section (B). Finally, over half of all news articles were produced by 10 authors, and almost all articles were produced by journalists from the *Las Vegas Review-Journal* or a financially affiliated organization. Given these results, this analysis argues the *Las Vegas Review-Journal* constructs a reality of climate change that is somewhat removed from the historical developments of environmentalism, where discussions encompassing conflict and potential economic consequences are the paramount constructs within climate change portrayals. This analysis further argues support for notions of framing theory, and the necessity to consider the regional, cultural and geospatial contexts when developing stimuli design for audience effects investigations.

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CHAPTER ONE

INTRODUCTION

In recent years, discussions of global climate change have become increasingly pervasive among various contemporary print media outlets, particularly with regard to its causation, direction, possibilities for mitigation, and responsible institutions or individuals (Ahchong & Dodds, 2012; Billett, 2010; Boykoff & Boykoff, 2007; Liu, Vedlitz, & Alston, 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zamith, Pinto, & Villar, 2012). Publications from the Intergovernmental Panel on Climate Change (IPCC) have also emerged with notable frequency, advocating a general consensus among scientists that climate change is anthropogenic (i.e., caused by human activities), and that various developed (and developing) nations reduce carbon dioxide emissions in order to avoid possibilities of catastrophic environmental phenomena (IPCC, 2007). Among the various institutions participating in the dialogue of climate change, news organizations (and subsequent print publications) have rendered conceptual schemas, or frames, that discuss environmental issues in terms that are heterogeneous, and at times, divergent from the advocacy posited by the IPCC (e.g., Boykoff & Boykoff, 2004; Jacques, Dunlap, & Freeman, 2008; Shehata & Hopmann, 2012). For example, Boykoff and Boykoff (2004) found climate change coverage in nationally distributed publications (i.e., the *New York Times*, the *Washington Post*, the *Los Angeles Times*, and *The Wall Street Journal*) intrinsically biased, such that articles provided equal exposure to supportive and oppositional arguments of anthropogenic climate change, which thus implicitly subverted the scientific legitimacy of the IPCC, and emboldened the validity of criticisms often situated in political, unscientific, terms. Given the divergent sources from

which climatological articles emerged in Boykoff and Boykoff's (2004) analysis, the IPCC, and mass mediated publications, have indeed remained heterogeneous with regard to discussions of global climate change.

The communication phenomena in which publications provide approximately equal exposure to arguments grounded in scientific research and political sentiment, begs the necessity for additional investigations to uncover particular nuances and general tendencies of climate change coverage across various publications in local, national and international regions. Indeed, prior analyses have investigated the conceptual schemas, or frames, appropriated to communicate global climate change in international print media (e.g., Ahchong & Dodds, 2012; Dotson, Jacobson, Kaid, & Carlton, 2012), U.S. national print media (e.g., Antilla, 2005; Boykoff & Boykoff, 2004; Wilkins, 1993) and U.S. regional print media (e.g., Liu et al., 2008), and such investigations have uncovered salient trends. Nonetheless, as anthropogenic climate change remains a frequently occurring topic among various print publications, so too does the necessity to continually analyze its portrayal within the channels that may inform myriad audiences.

In the regard of considering potential audience impacts, it remains equally important to consider the realities constructed within climatological portrayals and the potential subsequent impressions on audience perceptions of climate change, particularly with regard to understanding regional impacts or strategies to mitigate environmentally detrimental behaviors. Prior investigations have noted audience reliance on various media for climatological information among respondents in Sweden (Olausson, 2011) Germany (Arlt, Hoppe, & Wolling, 2011), New Zealand (Bell, 1994b), the United Kingdom (Lowe et al., 2006; Morton, Rabinovich, Marshall, & Bretschneider, 2011; Stamm, Clark, &

Eblacas, 2000), Japan (Sampei & Aoyagi-Usui, 2009), the U.S. (Corbett & Durfee, 2004; Price, Tewksbury, & Powers, 1997), and the Netherlands (Lecheler & de Vreese, 2012) and subsequently, such investigations have uncovered varying levels of media effects on perceptions of climate change. Results have uncovered: 1) a tendency for respondents to obfuscate the definition of climate change, and reference ozone depletion as one result of anthropogenic climate change (Bell, 1994b; Stamm et al., 2000); 2) the necessity for respondents to personally experience extreme climatological phenomena to increase personal salience of climate change (Lowe et al., 2006; Morton et al., 2011; Olausson, 2011); 3) short term awareness increase after exposure to a narrative stimulus of sudden anthropogenic climate change (Lowe et al., 2006); 4) increased awareness among respondents either interested in climate change or political issues (Corbett & Durfee, 2004; Lecheler & de Vreese, 2012); 5) increased respondent motivation to alter environmentally detrimental behavior when exposed to stimuli that portray possible individual mitigation strategies (Arlt et al., 2011); and 6) increased effectiveness for interpersonal communication to motivate respondent behavioral change to mitigate environmentally detrimental behavior (Stamm et al., 2000). Overall, such investigations have uncovered heterogeneous results among divergent respondent populations, which may be expected given the cultural diversity intrinsic of such geographies. Within the U.S., however, such investigations remain emergent, especially among representative respondent samples, from which implications for future research may be made.

With regard to technological shifts pertaining to print media publications, indeed, the distribution of physical newspapers has decreased markedly. Nonetheless, most publications have shifted distribution channels from physical, to online digital formats

that have allowed consumption of print media to occur on technological devices at increasing rates among various age groups (Pew Research Center, 2012). The Newspaper Association of America (NAA) recently uncovered relatively high rates of weekly print media consumption (disseminated either through newspapers or the Internet) among most U.S. adults 18 to 60 years or older (69%); young adults 18 to 24 years (59%); and adults 55 years or older (75.5%) (NAA, 2013). Thus, there remains the necessity to examine portrayals of climate change in print media given the sustained relevance and consumption of printed content, despite the shift of dissemination format from physical to digital.

The discussion and subsequent investigation that follows will provide a background of the publication under investigation (the *Las Vegas Review-Journal*), examine the historical orientation of environmentalism, the emergence of anthropogenic climate change as a social construct, and the three major areas of inquiry from which this investigation will draw for theoretical and methodological relevance. These three areas of inquiry include: 1) content analytic investigations of anthropogenic climate change in print media; 2) assessments of awareness and respondent perceptions and attitudes of anthropogenic climate change; and 3) examinations of the relationship between media coverage of climate change and subsequent audience effects. From this, an exhaustive review of literature will discuss prior investigations relevant to this analysis and to the interpretation of its results.

Purpose of the Study

The purpose of this study is to uncover the patterns of climatological print media coverage in a regionally distributed publication located in the southwestern United States (the *Las Vegas Review-Journal*) in order to assess the trends of particular schemas, or frames, that may ultimately yield formations or changes among audience impressions of climate change. Given the prevalence of the Internet for disseminating and consuming contemporary news content previously distributed in physical form (Pew Research Center, 2012), examining historical, climatological content longitudinally will provide some insight into the contexts in which climate change has been discussed in a specific local region (Las Vegas, Nevada), and any differences compared to previous analyses of nationally distributed publications (e.g., Boykoff & Boykoff, 2004; Liu, Vedlitz, & Alston, 2008; Zamith, Pinto, & Villar, 2012) and internationally distributed publications (e.g., Dirikx & Gelders, 2010; Olausson, 2009; Takahashi & Meisner, 2013). Furthermore, detailing the tendencies of climatological coverage may contribute to audience effects investigations by providing additional clarity for stimuli formation that reflects contemporary media outlets, as opposed to binary categories (e.g., see stimuli development in Morton et al., 2011). Thus, this study aims to provide a detailed assessment from which forthcoming content analysts and experimentalists may draw for insight and continued contribution to the assessment of climate change media coverage, and audience effects.

Justification for the Current Study

As portrayals of anthropogenic climate change become increasingly salient in print media (Ahchong & Dodds, 2012; Billett, 2010; Boykoff & Boykoff, 2007; Liu et al., 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zamith et al., 2012), so too does the necessity to continually examine regionally distributed publications that exist within environments and contexts that may be distinct, and divergent from the broader audiences of nationally distributed publications. In the literal sense, this applies to publications situated in environmentally precarious areas, such as the desert southwest—and particularly Las Vegas, Nevada—that have become increasingly sensitive to environmental change in terms of severe, prolonged drought, water distribution and urban planning (Futrell, 2001). As Las Vegas, Nevada remains situated approximately 30 miles from the Colorado River and the declining Lake Mead Reservoir, conditions of extreme drought have raised questions of political power, legitimacy of water consumption writ large in Las Vegas, and questions of causation that diverge from the pervasive anthropogenic model (Futrell, 2001). In turn, an analysis of mass mediated portrayals of climate change will begin to reveal the tendencies of climatological discussions constructed for a specifically relevant, regionally based, audience. Given this specific context in which publications are disseminated and consumed, this study will initiate the necessary questions that surround the constructed reality of one Las Vegas media publication, that may provide subsequent insight for forthcoming content analysts or experimentalists seeking to examine other regionally distributed publications, or media analyses of climate change among additional publications situated in Las Vegas, Nevada.

General Background

Emergence of the *Las Vegas Review-Journal*

The *Las Vegas Review-Journal* retains the highest distribution frequency of physical newspapers in Nevada, circulating over 160,000 physical newspapers everyday and over 220,000 physical copies each Sunday ("More Than A Century of Journalism," 2014; NewsBank, 2014). The publication emerged in 1909 as the *Clark County Review*, owned by Charles C. Corkhill, who leased the publication to T.S. Tresbell in 1922. That same year, Tresbell renamed the publication the *Las Vegas Review*, which gained popularity in the following years. Following multiple ownership changes between 1922 and 1929, the *Las Vegas Review* merged with the equally popular, *Las Vegas Age*, to produce the *Las Vegas Evening Review-Journal* in 1929. In 1949, Donald W. Reynolds acquired the publication and renamed it the *Las Vegas Review-Journal*, which was purchased by Stephens Media in 1993, following the death of Reynolds that same year ("More Than A Century of Journalism," 2014). As of the year of this writing (2015), Stephens Media remains the owner and operator of the *Las Vegas Review-Journal*.

History of Environmentalism and Anthropogenic Climate Change

The historical emergence of environmental preservation was indeed complex, and requires an exhaustive review to account for its current presence in contemporary Western society. This investigation, however, seeks not to provide an exhaustive and valid historical account of environmentalism, the emergence of nature as a social construct and notions of anthropogenic climate change, but a précis from which a general orientation may be derived.

Initial scholarship and explicit recognitions of the environment and nature emerged primarily during the Enlightenment (mid-eighteenth century), when the scientific method—and works by scholars such as Galileo and Descartes—"reduced what had been a mysterious and daunting world to mathematics" (del Mar, 2006, p. 8). Such epistemological developments contributed to notions of rationalization that permeated societal ideology, and subsequently, conceptions of the environment from capricious and unforgiving, to tractable and accommodating. Religious ideology—particularly Judeo-Christian theology—further catalyzed environmental rationalization during the mid-eighteenth century, as "Christians asserted that nature made itself available and useful to humans" for the extrapolation of materials necessary to satisfy the demands of business and trade (del Mar, 2006, p. 6). It was indeed the "Judeo-Christian God [who] transcended the earth rather than [reside] in or [emanate] from it" and as such, "[w]ordly existence was a fleeting prelude to eternal, hopefully heavenly, life" (del Mar, 2006, p. 6). Further, the "wilderness was where Christ had struggled with the devil and endured his temptations … [it] was a place to which one came only against one's will" (Cronon, 1996, pp. 8–9). Thus, ideological focus for Christian adherents accentuated the prominence of the afterlife, not the environment in which they inhabited. If anything, Christian adherents conceptualized their physical world as a means for religious *comme il faut* performance from which environmental exploitation was expected, encouraged and justified: natural resources were provided for them; it was God's gift; and an intermediary from which adherents could return to heaven. Although general, the Enlightenment rendered nature as mathematically and philosophically reducible. Judeo-Christian theology substantiated the extrapolation of natural resources for the benefit of

adherents and business pursuits, rather than a place for enjoyment or (re)creation. As such, this précis does not posit any specific historical relationships between the Enlightenment, Judeo-Christian theology, and subsequent effects on societal environmental ideology, rather, it provides a generalization of salient historical processes contributory to the contemporary movement popularly referred to as environmentalism.

The notion of *environment* as a distinct place—separate from the processes of modernity, Westernization, and the urban cores thereof—did not develop in isolation, rather, it emerged during the mid-nineteenth and early twentieth centuries—tantamount to the Industrial Revolution—as a social construct, by which *some* places were considered the quintessence of nature, and *others* not (Cronon, 1996; del Mar, 2006; Simmons, 1993).[1] Formerly, the natural landscape was considered not a place of enjoyment, or (re)creation, rather, one of pain and struggle. The conclusion of the nineteenth century yielded a new environmental ideology, when Thoreau (1862) "declare[d] wilderness to be the preservation of the world" (Cronon, 1996, p. 9). One notable figure and Nazi leader, Hermann Göring, may have also contributed to the initial embodiment of the environmental movement, and purveyor of the notion of nature as separate from domesticity and development: "Like many of his colleagues, including Hitler, he believed that German identity and strength resided in its natural landscape and that the nation's well being depended on the preservation of those features" (del Mar, 2006, p. 31). Yet, Göring adhered to rationalization of natural resources for controlled deforestation of roughly two million acres in Nazi Germany. Indeed, "Göring and other

[1] For additional literature on the social construction of nature, and the historical emergence of environmentalism, see Bell (2012); Cronon (1996); Dake (1992); Greider and Garkovich (1994); Hansen (1991); Lamb (1996); and Simmons (1993).

Nazi leaders venerated both natural landscapes and industrial growth" (del Mar, 2006, p. 32), among others within Europe and the U.S. This—synthesized with technological innovation, capitalism and religion—emasculated nature through seeming acquiescence for material abundance and perpetuation of emergent consumerism. In this regard, del Mar (2006) noted:

> Humanity had found the golden key to unlock prosperity's stubborn door. Transportation, commerce, agriculture, and industry accelerated. Yields of wheat and other staples swelled with such inventions and innovation as the seed drill, more efficient ploughs, and other implements, and intensified crop rotations—all the fruits of a more experimental, scientific, market-oriented approach to farming. Pastures, heaths, fens, and marshes were drained and put to work, forests cut to create space for more fields. (pp. 7–8)

Increased procurement of materials and environmental exploitation, however, worried some governmental actors in Europe and the U.S., and prompted promotion of environmental consciousness, or conservation, to retain and mitigate overt extrapolation of potentially limited resources. Germany, for example, governed a substantial forest conservation association and assembled at least 2,000 members by 1900 (del Mar, 2006). This was perhaps the initiation of environmentalism: bureaucratic recognition of successful natural resource extrapolation, and subsequent efforts to mitigate overt exploitation and depletion during the mid-nineteenth century.

The Industrial Revolution engendered increased institutional recognition of potential overt resource extraction and depletion, and subsequent policies to mitigate extrapolation to manageable levels. Among such policies was the appropriation of land which the U.S.

government considered pristine and representative of the natural environment. Their effort was to "preserve the world" in the midst of modernity and urbanization, and such differentiation yielded favorable results:

> One by one, various corners of the American map came to be designated as sites whose wild beauty was so spectacular that a growing number of citizens had to visit and see for themselves. Niagara Falls was the first to undergo this transformation, but it was soon followed by the Catskills, the Adirondacks, Yosemite, Yellowstone, and others. Yosemite was deeded by the U.S. government to the state of California in 1864 as the nation's first wildland park, and Yellowstone became the first true national park in 1872. (Cronon, 1996, p. 9)

Seemingly ubiquitous enthusiasm of environmental praise towards the end of the nineteenth century permeated notable figures of literature, from which the notion of environment as sacred, pristine, and somewhere outside of increasingly urban development was further concretized. Following the writings of Thoreau, there emerged notable writers whose renditions of wilderness evoked the "awesome power of the sublime" to which there were contributions "to the same myth: the mountain as cathedral" (Cronon, 1996, p. 12). Entirely contrary to the formerly held notion of environment as capricious, unforgiving and sinister, a new ideology of nature emerged: an ideology rendered by bureaucratic determination of ecological beauty, and subsequent separation from the destruction of Westernized urban development or resource extractions thereof. The paradigm of ecology shifted, and as such, *environmentalism* became the act of ecological preservation, albeit the preservation of areas considered nature, which included some, and omitted others (Cronon, 1996).

The ideology of preservation that favored some areas, and omitted others, was largely challenged following the release of Rachel Carson's (1962) publication, *Silent Spring*. Contrary to the bureaucratic conceptions of ecology and environmental control, Carson's (1962) account detailed the integral relationship between society and the environment, and specifically, the impacts of pesticides on birds (among other wildlife), and humans. In this sense, *Silent Spring* bridged the conceptual gap between otherwise polarized notions of the natural environment, human activities and individuals situated in rural and urban areas (Dunlap & Mertig, 2008; Kroll, 2008). Thus, environmentalism shifted to consider all things natural, beyond the designations of bureaucracy.

In a contemporary context, the social construction of environment remains historically grounded, such that national parks and other areas of designation prevail as contemporary places for (re)creation, and connection with what is regarded as sublime and awesome. Although the paradigm shift of the late eighteenth and twentieth centuries remain, there has emerged a new construct which has begun to erode the foundation of the emasculated, malleable natural environment, purveyed by various media and interpersonal communication: anthropogenic climate change.

The notion of *anthropogenic* climate change posits that technologies developed by humans emit environmentally detrimental particulates that cause inappropriate effects to various natural biological systems (Bell, 2012). Aside from scientific investigations into anthropogenic causations of climate change, philosophical investigations of anthropogenic climate change as an ideology remain oriented toward to the idea of environment as a social construction of reality (e.g., Cronon, 1996; Dake, 1992; Greider & Garkovich, 1994; Hansen, 1991; Lamb, 1996) to which changes—be they

anthropogenic or naturally caused—are only changes to the construct of anthropogenic and the environment itself. As such, the natural environment and subsequent changes as a result of modernization and the technologies thereof, are only changes to what societal participants consider change, or alterations to what should or should not be natural. Within this philosophical orientation, therefore, this investigation seeks to uncover the portrayal of a social construct, which posits the natural environment as influenced by human behavior, compared to the societal notion of constructed climatological normalcy.

Print Media Coverage of Climate Change

As frequency of climate change portrayals in print media has increased, so too has the complexity of such coverage. Content analytic scholars have uncovered various arguments present in such media, that have in turn depicted—or rather connected—the construct of climate change to actors or organizations (Ahchong & Dodds, 2012; Billett, 2010; Dirikx & Gelders, 2010; Dotson et al., 2012; Gordon, Deines, & Havice, 2010; Liu et al., 2008; Nielsen & Kjærgaard, 2011; Shehata & Hopmann, 2012; Takahashi, 2011; Takahashi & Meisner, 2013; Trumbo, 1996; Zamith et al., 2012). Such connection has often rendered allusions to organizational or individual responsibilities for mitigation of anthropogenic contributions (e.g., Dirikx & Gelders, 2010; Liu et al., 2008; Zamith et al., 2012), and/or explicitly questioned the legitimacy of such organizations or individuals (e.g., Billett, 2010; Takahashi, 2011; Trumbo, 1996). Such findings have tended to yield suppositions of audience confusion or conceptualization of climate change as a purely political issue (e.g., Ahchong & Dodds, 2012; Antilla, 2005; Boykoff, 2007; Boykoff & Boykoff, 2004, 2007; Dotson et al., 2012; Gordon et al., 2010; Liu et al., 2008; Nielsen &

Kjærgaard, 2011; Shehata & Hopmann, 2012; Trumbo, 1996; Wilkins, 1993) although survey research remains emergent to support such claims.

Content analytic scholars of climatological print media have begun to incorporate framing theory for inductive and deductive analyses that have uncovered emergent salient themes in various publications (e.g., Antilla, 2005; Gordon et al., 2010; Olausson, 2009; Shehata & Hopmann, 2012; Takahashi, 2011; Trumbo, 1996).[2] Entman (1993) defined media frames as the selection of "some aspects of a perceived reality" which are made "more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (p. 52). From this, Entman (1993) noted "[f]rames, then, *define problems … diagnose causes … make moral judgments …* and *suggest remedies*" [emphasis in original] (p. 52). Trumbo (1996) incorporated Entman's (1993) literal definition of framing to inductively analyze print media coverage of climate change in the *New York Times*, the *Washington Post*, the *Los Angeles Times*, *Christian Science Monitor*, and *The Wall Street Journal*. From a total sample of 252 articles, Trumbo (1996) found that 93% of articles contained at least one of Entman's (1993) framing elements. Further, Antilla (2005) conducted an inductive qualitative content analysis of varying print media to uncover "discrete scientific claims" (p. 341) of climate change from the U.S. and District of Columbia between March 1, 2003 and February 29, 2004. Antilla's (2005) analysis uncovered four distinct frames: "*valid science*; *ambiguous cause or effects … uncertain science*; and *controversial science*" [emphasis in original] (p. 344).

[2] According to Babbie (2010), inductive approaches consist of "general principles … developed from specific observations" whereas deductive approaches involve "specific expectations of hypotheses … developed on the basis of general principles" (pp. 22–23).

The majority of articles examined were framed as valid science, although there was significant coverage framed as ambiguous, uncertain or controversial. Zamith et al. (2012), on the other hand, conducted a deductive comparative content analysis of print media portrayals in South American and U.S. print media, and identified notable frequencies of the following frames: conflict and strategy frame; economic development and competitiveness frame; middle way/alternative path frame; morality and ethics frame; Pandora's box/Frankenstein's monster/runaway science frame; public accountability and governance frame; scientific and technical uncertainty frame; and the social progress frame. From this, Zamith et al. (2012) noted a tendency for South American and U.S. print media coverage to frame climate change "in terms of public accountability and governance" (p. 346). This, and other contemporary investigations of climate change portrayals in print media, have operationalized salient constructs—typically grounded in framing theory—which have in turn yielded notable and contributory results.

Public Perceptions of Climate Change

Scholars have uncovered a diverse range of public perceptions of climate change among various respondents in recent decades (e.g., Brulle, Carmichael, & Jenkins, 2012; Dunlap, 1998; Dunlap, Van Liere, Mertig, & Jones, 2000; Dunwoody & Peters, 1992; Kellstedt, Zahran, & Vedlitz, 2008; Ryghaug, Sørensen, & Næss, 2011; Ungar, 2000; Wibeck, 2014). Read et al. (1994), for example, found that "educated laypeople" expressed "a variety of misunderstandings and confusions about the causes and mechanisms of climate change" (p. 982). Read et al. (1994) noted such

misunderstandings consisted of confusion between ozone depletion and anthropogenic climate change, anthropogenic causations, and perceived possibility of regional impacts. Indeed, such findings within the epistemology of public perceptions of climate change have not been anomalous.

In their analysis of "mental models" by which respondents constructed individual conceptualizations of climate change, Bostrom et al. (1994) also uncovered tendencies for respondents to obfuscate anthropogenic climate change and ozone depletion, anthropogenic contributory behavior, potential regional impacts, and appropriate behavior alterations for anthropogenic contributory mitigation. Essentially, Bostrom et al. (1994) argued slight respondent misperceptions (e.g., respondent bifurcation of anthropogenic climate change and ozone depletion) essentially misinformed subsequent conceptualizations for appropriate behavioral alterations and interpretations of potential regional impacts. Further, Brulle et al. (2012) conducted a longitudinal analysis of the relationship between extraneous societal factors and respondent concern for anthropogenic climate change, and found "elite cues" (i.e., politically related events consisting of governmental actors of institutions) and "structural economic factors" to be most effective in yielding increased concern for climate change (p. 169). Conversely, Kellstedt's et al. (2008) assessment of respondent motivation to consider behavioral alteration revealed seemingly counterintuitive results, such that "the more information a person [knew] about global warming, the less responsible he or she [felt] for it" (p. 122).

Although some of such investigations have only alluded to media portrayals of climate change (e.g., Brulle et al., 2012; Dunlap, 1998; Ungar, 2000) such investigations have indeed extrapolated salient constructs for further incorporation and empirical

assessment. Moreover, prior assessments of climatological public perceptions have most often uncovered a general tendency for respondents to confuse the stark differences between the two phenomena of anthropogenic climate change and ozone depletion, and subsequent appropriate mitigation strategies. Such analyses have also uncovered the tendency for respondents to associate perceived climatological knowledge appropriation with varying degrees of personal responsibility to mitigate anthropogenic causations of climate change. These findings provide unique data from which additional constructs may be incorporated and operationalized to uncover the extent to which media may affect public perceptions of climate change.

Media Coverage of Climate Change and Audience Effects

Investigations by which media were incorporated and operationalized as climatologically framed stimuli indeed remained emergent, but increasingly robust (e.g., Corbett & Durfee, 2004; Lecheler & de Vreese, 2012; Lowe et al., 2006; Morton et al., 2011; Price et al., 1997; Sampei & Aoyagi-Usui, 2009). Scholars have also employed qualitative methodologies to extrapolate intricacies in the relationship between media portrayals of climate change and audience perceptions of climate change (e.g., Bell, 1994a; Olausson, 2011). Among these investigations, scholars have generally uncovered small but statistically significant relationships between varying media stimuli and respondent perceptions of climate change and/or intentionality to alter behavior (Corbett & Durfee, 2004; Lecheler & de Vreese, 2012; Lowe et al., 2006; Price et al., 1997).

Lecheler and de Vreese (2012), for example, conducted an experiment by which respondents were exposed to various climatologically framed stimuli repetitively over

varying frames of time. From this, Lecheler and de Vreese (2012) uncovered weak effects on respondent opinion, but stronger effects after multiple stimuli exposures within shorter periods of time. Lecheler and de Vreese (2012) further incorporated and operationalized political literacy and noted weaker attitude changes after multiple exposures to climatologically framed stimuli, but increased potential for such respondents to contextualize fragmented portrayals of climatological information as opposed to politically illiterate respondents. Morton et al. (2011) further incorporated the depiction of climate change uncertainty within stimuli design for administration in two experiments, to uncover effects on respondent intentions to mitigate environmentally detrimental behaviors. Morton et al. (2011) noted high, statistically significant, respondent intentions to alter detrimental behaviors after exposure to stimuli framing climate change in positive, uncertain terms in their first experiment, but not the second. Although results were conflicted, Morton et al. (2011) argued the potential for particular frames discussing climate change to increase intentions among respondents to alter environmentally detrimental behaviors, regardless of respondent literacy of climate change causations, or proclivities for respondents to obfuscate phenomena such as anthropogenic climate change and ozone depletion. Although suppositional, the relationship between respondent illiteracy and intentions to alter detrimental behaviors as influenced by distinct climate change frames needs additional investigation.

Current investigations of the relationship between media portrayals of climate change and subsequent audience effects have tended to incorporate prior survey and content analytic research to increase reliability and validity for data collection and assessment (e.g., Corbett & Durfee, 2004; Lecheler & de Vreese, 2012; Morton et al., 2011).

Although such inquires have indeed provided additional theoretical grounding and ecological validity, continued necessity for incorporation of content analytic survey investigations of public perceptions remains.

Organization of Thesis

This chapter précised the historical orientation of environmentalism, the emergence of anthropogenic climate change as a social construct, print media portrayals of climate change, public perceptions of climate change, impacts of climatological print media on audience perceptions, and a justification for analytic pursuit. Chapter Two will extensively outline prior scholarly literature pertinent to portrayals of anthropogenic climate change in print media and subsequent audience perceptions of climate change portrayals in print media. Chapter Three will review the methods engaged for the current investigation. Chapter Four will provide research findings. Chapter Five will incorporate further discussion of the results, review implications and provide recommendations for future inquiry.

CHAPTER TWO

LITERATURE REVIEW

The review that follows will provide an increasingly detailed report of the concepts and research introduced in the previous chapter pertaining to content analyses of climatological portrayals and the relationship between such media portrayals and audience effects. Analyses within the two subordinate sections—*Content Analyses of Climate Change Coverage in Print Media* (p. 20) and *Audience Effects of Climate Change Media Coverage* (p. 35)—are reviewed individually and were selected according to relevance.

Content Analyses of Climate Change Coverage in Print Media

Dirikx and Gelders (2010) conducted a longitudinal content analysis of popular newspapers from the Netherlands (*De Volkskrant* and *NRC Handelsblad*) and France (*Le Monde* and *Le Figaro*) between 2001 and 2007 to uncover characteristics of climatological portrayals during the annual United Nations Conferences of the Parties. Dirikx and Gelders (2010) incorporated framing theory according to Entman (1993), and a deductive coding scheme developed by Semetko and Valkenburg (2000) to uncover the presence of the following five frames: 1) *attribution of responsibility* frame; 2) *human interest* frame; 3) *conflict* frame; 4) *morality* frame; and *economic consequences* frame. Dirikx and Gelders (2010) noted no previous studies that incorporated the coding scheme to analyze portrayals of climate change, and thus argued their investigation exploratory. The authors posited no specific research questions, but advanced five hypotheses

regarding the overall presence of particular frames over time. Specifically, Dirikx and Gelders (2010) hypothesized: 1) higher frequencies of appearance of the attribution of responsibility and economic consequences frames over the conflict, human interest and morality frames; 2) few, if any, appearances of the morality frame; 3) decreased levels of appearance of the conflict frame from 2001 to 2007; 4) statistically insignificant variations of appearance levels between the attribution of responsibility, economic consequences, human interest and morality frames; and 5) insignificant variations of coverage between the Dutch and French publications.

Articles were attained by use of the key terms *climate change*, *global warming*, and *greenhouse effect*, although no specific database was mentioned. Further, initial searches conducted by the authors yielded few articles published at times outside the United Nations Conferences of the Parties. Thus, only articles relevant to the conferences were included in the final sample for analysis. Overall, Dirikx and Gelders (2010) analyzed 257 articles: "52 from *De Volkskrant*, 62 from *NRC Handelsblad*, 67 from *Le Figaro* and 77 from *Le Monde*" (p. 737). The authors incorporated Cronbach's alpha to assess the internal consistency of each climatological frame that contained three to five questions to which coders answered Likert-type scale questions from "don't agree" to "completely agree" (Dirikx & Gelders, 2010, p. 736). Unspecified questions were eliminated from the human interest, conflict and economic consequences frame in order to yield internal consistency levels above .70. Finally, Dirikx and Gelders (2010) calculated the mean number Likert-type scale answers indicating at least some degree of presence, for each year, within each frame to determine overall frame presence. From this, Dirikx and

Gelders (2010) produced a scale in which 1 indicated complete absence of a particular frame, and 3 indicated complete presence.

Results revealed a greater average presence of the attribution of responsibility and economic consequences frames over the human interest, conflict and morality frames in all four publications between 2001 and 2007. Average appearance scores of the morality frame were negligible in all four publications, and far less than then attribution of responsibility, human interest, conflict and morality frames. Average appearance scores of the conflict frame fluctuated from 2001 to 2007, and the authors reported no statistically significant differences (by use of ANOVA) between appearance scores of frames within the four publications. Finally, the authors found no statistically significant differences (by use of *t*-tests) of average appearance scores between the Dutch and French publications except for the human interest frame ($t = 2.015$, $p < .05$). Thus, Dirikx and Gelders (2010) found support for hypotheses one, two, four and five.

The authors found their results consistent with previous content analyses of climate change portrayals with regard to frequent discussions of institutions or individuals responsible for climate change (attribution of responsibility frame) and potential economic ramifications of altering technologies considered environmentally detrimental (economic consequences frame). Dirikx and Gelders (2010) referred to Rogers's (1983) "protection motivation theory" and posited the presence of such frames to be an indicator of latent advocacy for readers to alter behaviors considered environmentally detrimental. Although suppositional, the authors argued this a possibility and noted the necessity for additional research to incorporate the aforementioned coding scheme across various

publications, in addition to increased studies examining attitudinal changes among audiences.

Ahchong and Dodds (2012) content analyzed print media coverage of climate change from 1988 to 2007 to uncover frequency of article publication over time, and how climate change was portrayed. Specific theoretical grounding was not elucidated, although Ahcong and Dodds (2012) sought to uncover the context of climatological portrayals that could have incorporated framing theory. Data were collected from two Canadian newspapers: the *Toronto Star* (a regionally distributed newspaper) and the *Globe and Mail* (a nationally distributed newspaper). Prior longitudinal content analytic research informed the framework by which the analysis was conducted and research objectives proposed. Deficits in prior research of regional publications included limited time frames and units of analysis. Expanded time frames and additional units of analysis (i.e., regional and national publications) were incorporated to uncover longer-term trends and to increase generalizability.

Specific causal relationships and hypotheses were not stated, rather, five research objectives were posited: 1) determine salience of coverage over time; 2) examine issue image, scope and connection to other issues; 3) outline proposed solutions and involvement of interest groups; 4) determine sources of scientific information; and 5) examine similarities and/or dissimilarities between the regional and national publications. Issue scope was defined as "the size of the geographical region or jurisdiction … impacted by anthropogenic climate change as implied or stated in the article" (p. 53). Following this, the authors sought to explore possible ramifications of such coverage.

Articles from both publications were obtained by searching an online database using the terms *greenhouse gas*, *climate change* and *global warming*. All articles were read to ensure subject relevance. Irrelevant articles—including "[e]ditorial, comment and opinion pieces … [and] letters to the editor"—were disregarded accordingly (p. 51). Overall, 2,893 articles from both publications were determined relevant for analysis. Articles were coded for issue image; issue scope; interest groups; governmental actors; types of solution strategies; inclusion of scientific information; and linkage to other issues. Codebook testing was conducted with "100 randomly selected articles" although inter-coder reliability was not reported (p. 51).

Results revealed an overall increase in climate change coverage in both publications from 1988 to 2007. Two variables for each publication were measured to determine climate change salience: 1) the quantity of relevant articles published annually; and 2) the quantity of words in relevant articles published annually. A linear regression analysis of annual article frequency and word quantity uncovered "[s]trong correlations" between the two publications (p. 51). As such, inter-publication salience increased over time and was concomitant. Coverage of issue image and scope revealed that most articles portrayed climate change as "destructive" and were national or international in scope (p. 53). Most coverage of solution strategies promoted mitigation rather than adaption to climate change. Interest groups were covered almost equally across categories of "environmental, scientific-professional, [and] industry" (p. 54). Most coverage was found to either include national governmental leaders, or no governmental actors, and solution strategies were largely depicted as a governmental responsibility. Finally, the majority of scientific

citations in both publications came from academic sources. Ahchong and Dodds (2012) noted this finding with prior research.

Prevalence of national or international print coverage scope in both publications was considered detrimental in its potential audience effects, such that broad-scope coverage was not localized and likely failed to promote individual behavior/consumption alterations, or changes to future local policy. Although regional and national publication coverage was similar, the authors called for future analyses to examine multiple regional publications for comparison, especially publications situated in environmentally precarious areas.

Boykoff and Boykoff (2004) conducted a longitudinal content analysis of print media coverage in order to uncover how scientific climate change information was portrayed, and whether such coverage concomitantly presented oppositional, unscientific arguments. Explicit theoretical grounding remained elusive, although efforts to uncover the ways by which climate change was portrayed could have incorporated framing theory. Boykoff and Boykoff (2004) analyzed newspaper articles in the U.S. "prestige-press" (i.e., the *New York Times*, *Los Angeles Times*, the *Washington Post* and *The Wall Street Journal*) from 1988 to 2002. The authors incorporated the concept of journalistic norms, and specifically, the norm of balance (i.e., the obligation for journalists to present supportive and oppositional arguments) to contextualize article analysis and inform coding. No specific hypotheses or research questions were explicitly stated, rather it was implied that balanced coverage would obfuscate scientific consensus of anthropogenic influences on climate change and inadvertently depict scientific consensus and unscientific opposition as tantamount.

Newspaper articles from prestige-press publications were obtained by searching three online databases (Lexis-Nexis, National Newspaper Index and ABI/Inform), using the term *global warming*. Boykoff and Boykoff (2004) excluded "opinion editorials, letters to the editor, book reviews … editorial columns [and] stories from the Style/Fashion, Real Estate, and Sports sections" (pp. 127–128). The search yielded 3,543 articles, from which 636 articles were selected for analysis after a systematic random sample. Coverage was categorized for its presentation of arguments and action to mitigate further anthropogenic climate change. Specifically, articles either: 1) presented information and arguments only in complete support of anthropogenic climate change; 2) presented information and arguments which supported and opposed anthropogenic climate change and emphasized the probability of its existence; 3) presented roughly equal amounts of information and arguments in support of and opposition to anthropogenic climate change; or 5) presented information and arguments which supported and opposed anthropogenic climate change and emphasized the improbability of its existence. Portrayals of anthropogenic mitigation strategies emphasized either: 1) "immediate/mandatory" action; 2) "cautious/voluntary" action; or 3) equal attention "that ranged from cautious to urgent and from voluntary to mandatory" (pp. 131–132). Publications from the Intergovernmental Panel on Climate Change (IPCC) were also coded for comparative analysis. The authors noted acceptable inter-coder reliability (93%), although specific statistical procedures were not detailed.

Results revealed that most prestige-press articles (52.65%) were balanced (i.e., contained both supportive and oppositional arguments of anthropogenic climate change) between 1988 and 2002. Articles that contained balanced coverage but emphasized the

existence of anthropogenic climate change were also prevalent (35%). Longitudinal analysis uncovered no significant increase of balanced articles from 1988 to 2002, but a significant increase for balanced coverage that emphasized the existence of climate change. Comparative analysis of prestige press articles and IPCC publications revealed significant deviations from scientific consensus and certainty expressed by the IPCC from 1990 to 2002. This was expected, as 94% of prestige-press articles during the time frame presented (at least) some climate change skepticism. Most portrayals of anthropogenic mitigation strategies (78%) provided equal attention to both immediate and cautious actions, and such coverage increased significantly from 1988 to 2002. Comparative analysis of mitigation strategies in prestige-press articles and IPCC publications revealed significant deviations from IPCC recommendations for immediate and mandatory actions. Again, this was expected, as 89% of prestige-press articles expressed (at least) some caution towards immediate mitigation strategies.

The prevalence of balanced coverage was considered inadvertently tendentious, such that unscientific and scientific information were concomitantly portrayed in prestige-press articles, and thus equally valid. Boykoff and Boykoff (2004) noted the prevalence of balanced coverage among scientific consensus reports and exhaustive data released by the IPCC confirming the existence of anthropogenic climate change. Boykoff and Boykoff (2004) noted the possibility of such informational polarization to cause public confusion, misinform policy and increase the politicization of climate change.

Liu et al. (2008) content analyzed print media coverage of climate change in the *Houston Chronicle* from 1992 to 2005 to examine article salience and portrayal attributes over time. Prior analyses of print media coverage of climate change were incorporated to

inform longitudinal analysis and discuss potential audience effects, although specific theoretical grounding was not explicated. Liu et al. (2008) cited insufficient prior research of regionally distributed U.S. publications—especially in environmentally precarious areas such as the Texas Gulf coast—to substantiate analysis necessity. Specific hypotheses and/or research questions were not advanced, rather, three research objectives were identified: 1) track frequency of climatological coverage over time; 2) uncover salient article attributes; and 3) document the frequency with which coverage included scientific sources and/or information.

Articles were obtained from an online database (Lexis-Nexis) using the terms *climate change, global warming* and *greenhouse gas.* The search yielded 1,197 articles, of which 795 were determined relevant for analysis. Identification of article attributes required operationalization of the following: 1) *issue image* (whether coverage portrayed climate change as harmful, mixed, undetermined, or not harmful); 2) *issue scope* (whether coverage included "local, state, multi-state, U.S. national … [or] international-global" regions); 3) *issue linkage* (whether coverage connected climate change to other broad social issues); 4) *issue participants* (whether coverage included organizations of environmental advocacy, science, government or industry); 5) *proposed solutions and responsible parties* (whether coverage include solution strategies or responsible groups for solution initiation); and 6) *proposed treatment solutions* (whether coverage included solution strategies for mitigation of, or adaption to, anthropogenic climate change) (pp. 382–388). Liu et al. (2008) noted acceptable inter-coder reliability levels but did not disclose which statistical procedures were used.

Results uncovered an overall increase of anthropogenic climate change coverage from 1992 to 2005, and such coverage was contextually national or international in issue scope. Analysis of *issue image* between 1992 and 2005 revealed most articles (77.99%) portrayed climate change as harmful, and 51.45% presented no solutions for anthropogenic mitigation or climate change adaption. Longitudinal analysis of issue image uncovered a slight increase of harmful portrayals of climate change from 1992 to 1995. *Issue linkage* revealed salient connections to issues with energy, international cooperation, and scientific consensus. Less frequent, but still significant issue linkages included potential macro-economic consequences and transportation issues. Analysis of *issue participants* uncovered significant article frequency of environmental advocacy groups between 1992 and 2005, and longitudinal analysis revealed an increase of environmental advocacy group coverage inclusion over time. Most coverage that contained any governmental institutions and/or actors tended to portray the president, as opposed to federal or local agencies. Organizations portrayed as responsible for anthropogenic solution strategies were almost equally governmental (26.54%) and non-governmental (24.28%), although significantly more coverage (49.18%) identified no responsible organizations. Finally, coverage tended to cite academic sources for climatological information, as opposed to governmental organizations, environmental advocacy groups, or industry.

Liu et al. (2008) found the prevalence of national and international scope coverage potentially misleading, such that emphasis for individual contributions to anthropogenic climate change were not explicated, and thus potentially interpreted as an issue caused by others. In this regard, increasing climatological salience in print media was interpreted as

problematic, such that individual contributions were explicated less frequently. In addition, the proliferation of oppositional or critical arguments was seen to cause additional confusion to the empirical support of anthropogenic climate change existence.

Shehata and Hopmann (2012) conducted a comparative content analysis of two national print media publications from the U.S. and Sweden to uncover article salience over time and the possible influence of domestic political institutions on climatological frames during two events: 1) the Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997); and 2) the United Nations Climate Change Conference at Bali (2007). Shehata and Hopmann (2012) incorporated framing theory according to Entman (1993, 2009) and Scheufele (1999) for deductive climatological frame analysis, although specific explication of rationale for incorporation remained elusive. Publications from which U.S. articles were analyzed included the *New York Times* and *Washington Post*, while Swedish publications included the *Dagens Nyheter* and *Svenska Dagbladet*. Longitudinal analysis was employed to analyze article salience over time from 1997 to 2007, and cross-sectional analysis to identify frequency of domestic political sources by which supportive or oppositional climate change frames (i.e., the *scientific-uncertainty frame* or the *economic consequences frame*) were posited during the Kyoto and Bali events.

Two research questions and four hypotheses were advanced to uncover the incorporation of domestic political institutions and/or actors into print media coverage of climate change during the Kyoto and Bali events, and frequency of oppositional frames. Shehata and Hopmann (2012) hypothesized a prominence of oppositional climate change frames in U.S. coverage as opposed to Swedish coverage and frequent incorporation of

domestic and foreign political institutions and/or actors. Hypotheses for longitudinal analysis were implicit and suggested the increase of climate change coverage from 1997 to 2007, and a prominence of domestic political officials in U.S. coverage.

Newspaper articles were obtained from three online databases (Lexis-Nexis for U.S. coverage, and Presstext and Mediearkivet for Swedish coverage) using the search terms *Kyoto*, *Bali*, *climate change* and *global warming.* The search yielded 934 U.S. articles and 847 Swedish articles after irrelevant coverage was omitted accordingly. Frame identification required coders to read "the initial 50 percent of the paragraphs of each article" (p. 183). Supportive frames were identified when anthropogenic climate change causations or mitigation strategies were discussed. The *scientific-uncertainty frame* required critical coverage of anthropogenic climate change or emphasis that natural climate fluctuations rendered global warming. The *economic consequences frame* required coverage to discuss any financial implications of climate change. Articles were further coded for linkage to domestic political officials, foreign officials, or non-governmental officials (i.e., academicians or members of non-governmental organizations). Cohen's (1960) κ yielded acceptable values for inter-coder reliability.

Results revealed an overall increase of climate change coverage in U.S. and Swedish print media from 1997 to 2007. Article linkage to domestic political institutions was markedly higher in U.S. coverage (38.2% in the *New York Times* and 36% in the *Washington Post*) as opposed to Swedish coverage (20.2% in *Dagens Nyheter* and 13.2% in *Svenska Dagbaldet*) between 1997 and 2007. Coverage from both U.S. publications also contained more governmental sources during both events than Swedish print media. Most U.S. and Swedish coverage during the Kyoto and Bali events presented supportive

frames of anthropogenic climate change, and almost no oppositional frames. As such, Shehata and Hopmann (2012) found support for their first three hypotheses, and only partial support for their fourth hypothesis.

Shehata and Hopmann (2012) noted a general similarity of coverage in U.S. and Swedish print media, although U.S. coverage was more often linked "to activities taking place within major domestic political institutions" and often reliant on political actors for information (p. 188). Contrary to prior research of oppositional climate change frames in print media, the authors discussed their findings of essentially no oppositional print media coverage during the Kyoto and Bali events. The authors argued that coding for oppositional climate change frames only during the Kyoto and Bali events accounted for lack of oppositional frames.

Gordon et al. (2010) content analyzed print media coverage of climate change in a Mexico City newspaper—the *Reforma*—from 2004 to 2006 to assess article intensity and framing of anthropogenic climate change. Gordon et al. (2010) cited deficient prior examinations of Latin American publications to substantiate analysis necessity. As such, prior longitudinal content analytic frame analyses were incorporated to inform deductive coding, and additional exploratory measures and statistical procedures were operationalized to assess frame intensity.

Specific hypotheses were not stated, rather three research questions—and three sub-questions—were posited to uncover: 1) types and intensities of climatological frames; 2) whether frames presented scientific conflict in the United States; 3) whether frames portrayed geopolitical conflict between northern and southern Mexico; 4) frequency and intensity of solution strategies; 5) scope of posited solution strategies (whether regional,

national or global in scope); and 6) frequency of climatological article publication during international climate change conferences.

Data were collected from an online database (LexisNexis) using the terms "*calentamiento global* (global warming)" and "*cambio climático* (climate change)" which yielded 144 articles relevant for analysis [emphasis in original] (p. 154). Prior research informed coding procedures to uncover the following frames: 1) the *economic frame*; 2) *political frame*; 3) *ecology/science frame*; 4) *consequences frame*; 5) *international relations frame*; 6) *scientific controversy/conflict frame*; 7) *North/South conflict frame*; 8) *U.S. conflict frame*; 9) *alternative energy/technology frame*; 10) *entertainment frame*; and 11) *solutions frame.* An exploratory intensity index was also incorporated to assess the following characteristics: 1) article length; 2) placement of article frame (i.e., present in headline, first paragraph, second paragraph, etc.); 3) placement of solution strategy (if present); and 4) placement and frequency of the terms *calentamiento global* and/or *cambio climático*. Prominent placement of frames and solution strategies, repetition, increased article length, and frequency of key terms yielded higher intensity scores (on a scale from 0 to over 100). Intensity ranged from low (0–49), medium (50–99) to high (100 plus). The authors noted significant inter-coder reliability (.88 in the year 2006, and .78 in the year 2009) although specific statistical procedures for calculation were not disclosed.

Results revealed that most articles (47.9%) were of medium intensity, while 16.7% were of high intensity, and 35.4% of low intensity. Placement of climatological articles tended to occur within the first ten pages of the publication (59.2%). Analysis of frame frequency revealed that most articles (69.4%) contained the *ecology/science frame*,

followed by the *consequences frame* (58.3%). Both frames also "appeared in the most number of stories at high intensity and the most number of stories at medium intensity" (p. 161). The authors noted insignificant frequency and intensity of the *scientific controversy/conflict frame* and the *energy/technology frame.* Conflict between northern and southern Mexico (*North/South conflict frame*) was portrayed in 15.9% of the articles, although most articles (97%) yielded low intensity scores. Proposed climate change solutions (*solutions frame*) most frequently mentioned international treaties (40.9%) and national policies (35.4%), although frame intensity remained low. Finally, analysis of article publication frequency during international climate change events revealed significantly more articles published during the Tenth Conference of the Parties at Buenos Aires (December, 2004), and the Eleventh Conference of the Parties at Montreal (December, 2005).

Although suppositional, Gordon et al. (2010) attributed the infrequency of highly intense climatological articles (16.7%) to increased salience of "the narcotics trade, immigration, and economics" in Mexico (p. 165). Proliferation of the *ecology/science frame* was noted as contrary to prior investigations of print media outside of the U.S. (which mostly noted high frequency of the *international relations frame*), and was attributed to the environmental precariousness of Mexico City. Finally, the authors (speculatively) argued that high article frequency during international climate change conferences may have contributed to increased audience attention to the issue of climate change.

Audience Effects of Climate Change Media Coverage

Corbett and Durfee (2004) conducted an exploratory study to uncover reader assessment of climate change science portrayals in various newspaper articles. Incorporation of theoretical grounding remained elusive, although Corbett and Durfee (2004) noted particular print media elements such as "context, story structure, visuals, and story framing" as salient attributes within administered stimuli (p. 135). Various print media portrayals of climate change science were administered to experimental and control groups for observation of opinion change. Prior content analytic research of climate change frames informed stimuli design, such that climatological articles either: 1) included supportive scientific evidence of climate change; 2) included supportive and oppositional scientific evidence of climate change; or 3) included only oppositional scientific evidence of climate change. Deficient prior research of audience interpretations of climatological print media portrayals substantiated analysis necessity.

Two hypotheses were identified to investigate the effects of varying print media coverage of climate change science on reader certainty of climate change, and one hypothesis to identify the relationship between respondent environmental ideology and "prior certainty about the existence of global warming" (p. 137). Specifically, the first two hypotheses posited that: 1) administration of a stimulus scientifically supportive of climate change would increase reader certainty of climate change science, while administration of a stimulus scientifically oppositional of climate change would decrease reader certainty; and 2) administration of a stimulus both scientifically supportive and oppositional would yield higher reader certainty than the scientifically oppositional stimulus, but lower reader certainty than the supportive stimulus. The third hypothesis

posited a positive relationship between individual environmental ideology and "prior certainty" of climate change legitimacy (p. 137).

Stimuli appeared as newspaper articles and featured a story about thickening Antarctic ice sheets. Stories either included scientific support (referred to as *context*), opposition (referred to as *controversy*), or both support and opposition of climate change. Surveys were administered to four undergraduate groups (three experimental groups; one control group), each of roughly 50 respondents. Each survey contained 19 Likert-type scale questions that evaluated respondent certainty of climate change, environmental ideology and prior certainty of climate change.

Results revealed that administration of the context stimulus increased reader certainty of climate change science beyond groups who received the amalgamated context and controversy stimulus, and autonomous controversy stimulus. Reader certainty for the experimental groups increased as exposure to the context stimulus increased, and all experimental groups yielded higher reader certainty than the control group (which received articles with neither context nor controversy). A one-way ANOVA confirmed significant difference of reader certainty between all four groups (p = .00), and a Bonferroni post hoc test further revealed significant difference of reader certainty between those who received the context stimulus and amalgamated context and controversy stimulus (p = .00). Finally, the authors noted a "significant, positive correlation between environmental ideology and prior certainty about global warming (r = .35, p = .01)" (p. 141).

Overall, reader certainty increased as inclusion of context increased, and conversely, reader certainty decreased as inclusion of controversy increased. Although exploratory

and conducted with a convenience sample, Corbett and Durfee (2004) argued sensitivity of reader certainty when exposed to varying climate change science stimuli. Such findings were argued as salient and relevant for future inquiry, as media remain a significant source by which lay populations obtain climatological information.

Morton et al. (2011) conducted two experiments to investigate the effects of message framing and uncertainty on respondent attitudes and intentions to engage in climate change mitigation behavior. Prior analyses of health communication, environmental framing, and the concept of efficacy (i.e., the idea that an individual can affect change in an uncertain situation), were incorporated for theoretical grounding and stimulus design in both experiments. Stimuli incorporated varying levels of uncertainty (*high* or *low*) framed positively or negatively. Negative frames emphasized the possibility of anthropogenic climate change effects, while positive frames emphasized the possibility of climate change effects not occurring.

No specific research questions or hypotheses were stated, rather, hypotheses were implied for both experiments. Morton et al. (2011) expected to find a "two-way interaction between level of uncertainty and framing on individual action in response to climate change messages" (p. 105). That is, participant intentions to alter behavior were estimated to decrease when uncertainty was high, negatively framed and the message focused on possible negative results of climate change. Conversely, participant intentions to alter behavior were estimated to increase when uncertainty was low, positively framed, and the message focused on possible positive outcomes of climate change.

Both experiments incorporated university students for respondents (experiment one, N = 88; experiment two, N = 120), and each incorporated two experimental groups for

administration of a positively and negatively framed stimulus. Varying levels of uncertainty in stimuli were distributed among the two experimental groups for both experiments, although specific methodology for distribution was not disclosed. After administration of the stimulus, respondents were asked to indicate intentions to change behavior by use of a semantic differential scale. Experiment two extended the inquiry pursued in experiment one, but operationalized personal efficacy by use of a semantic differential scale for four separate statements, to which a respondent could range from *strongly disagree* to *strongly agree.* Morton et al. (2011) employed two-way ANOVAs for both experiments to uncover the impact of framing and uncertainty on respondent intention to alter behavior.

Results for experiment one uncovered a "significant interaction effect between framing and uncertainty" ($p = .036$), such that lower uncertainty "resulted in stronger willingness to act" than higher uncertainty when the stimulus was framed negatively (p. 106). Positive framing and varying levels of uncertainty, however, did not yield statistically significant results. Overall, experiment one provided "some support" for the aforementioned hypotheses, such that negative framing of stimuli, combined with high and low uncertainty, yielded statistically significant respondent intentions to alter behavior. Results for experiment two revealed converse results to experiment one, such that negative framing of the stimulus and high/low uncertainty yielded insignificant differences of respondent intentions to mitigate behavior ($p = .292$), while positive framing of the stimulus and high/low uncertainty yielded significant differences of respondent intentions to mitigate behavior ($p = .007$). Morton et al. (2011) further incorporated the effects of efficacy "as a possible mediator" of respondent intentions to

alter behavior when exposed to various frames and found a significant influence of highly uncertain stimuli on personal efficacy (p = .045) compared to low uncertain stimuli (p = .712).

Morton et al. (2011) noted the complexity of communicating and measuring the effects of climatological frames on respondent intentions to alter behavior, but found results from experiments one and two indicative of the potential for varying frames and levels of certainty to affect respondent intention to alter behavior. As such, the authors noted the necessity for further message framing analyses.

Lowe et al. (2006) incorporated quantitative and qualitative methods to uncover the short and medium-term effects of a fictional cinematic depiction of sudden anthropogenic climate change (*The Day After Tomorrow*) on audience perceptions of climate change. Specific theoretical grounding was not explicated, however, Lowe et al. (2006) sought to extend prior content analytic investigations of climate change portrayals in the media to incorporate effects on audience perceptions and/or behavioral changes. No research hypotheses or questions were stated explicitly, rather, four objectives were implicitly posited to uncover: 1) audience perceptions of sudden climate change before and after administration of the stimulus (*The Day After Tomorrow*); 2) audience concern towards climate change before and after administration of the stimulus compared to other international issues; 3) audience motivation to mitigate anthropogenic climate change before and after administration of the stimulus; and 4) audience perceptions of human responsibility for climate change before and after administration of the stimulus.

Quantitative data were collected by administration of a survey at a movie theatre in Norwich, U.K. that contained five Likert-type scale questions (in addition to

demographically related questions) to be answered before administration of the stimulus, and 14 Likert-type scale questions to be answered after administration of the stimulus. Additional semantic differential scales were included to measure perceived possibility of sudden climate change, or climate change at large. Descriptive statistics were employed to uncover demographic trends, and *t*-tests to measure mean difference and significance of experimental groups before and after stimulus administration. Surveys were administered to 404 respondents from which 301 were determined interpretable for analysis. Qualitative data were collected from the original survey participants one month after viewing the film. Specifically, Lowe et al. (2006) conducted three focus groups of 11 total participants. Initial prompts included discussion of thoughts about the film, while subsequent prompts elicited discussion of audience perceptions of sudden climate change possibility, concern, motivation and responsibility.

Quantitative descriptive statistics uncovered a young demographic from which data were collected (12–19 years of age: 15.3%; 20–29 years of age: 30.9%; 30–39 years of age: 26.6%; etc.). Mean scores of climate change perceptions differed significantly between prior and subsequent stimulus administration, and such significance was retained only for climatological issues (climate change, $t = 4.018$, $p < .001$; radioactive waste, $t = 2.717$, $p = .007$; and biodiversity, $t = 4.316$, $p = .001$), while variables related to global issues revealed insignificant results (terrorism, $t = .462$, $p = .645$; AIDS, $t = 1.573$, $p = .117$; and poverty, $t = .818$, $p = .414$). Qualitative data from focus group discussions revealed: 1) concern for social impacts of climate change; 2) respondent criticism of scientific legitimacy and imminence of sudden climate change portrayed in the film; 3) concern for forthcoming adaptability and/or vulnerability to climate change; 4) perceived

responsibility of various institutions and individuals to initiate mitigation strategies; and 5) criticism of environmental exploitation and overt consumption ensued in Western societies.

Overall, Lowe et al. (2006) noted respondent distrust in unscientific (or entertainment) media in its portrayal of extreme and immediate anthropogenic climate change, although respondents cited relatable climatological experiences, and increased belief in climate change at large. Further, criticisms of Westernization—and marginalization of disadvantaged countries—was often discussed in focus groups, and perceived as a major contributor to anthropogenic causations of climate change. The authors found respondents "more motivated" and "aware of the problem of climate change, but unclear as to its causes and effects" (p. 452). As such, Lowe et al. (2006) found their results significant for further investigation of climate change portrayals and subsequent audience effects.

Stamm et al. (2000) employed cross-sectional survey methodology to investigate public understanding of anthropogenic climate change, source of climatological knowledge, and respondent contemplation of climate change solution strategies. Stamm et al. (2000) referenced prior content analytic investigations of climate change portrayals, and survey research of public interpretations of climate change to formulate an exploratory model for measuring respondent *engagement* with the issue of climate change. Specifically, this model categorized respondents as either: 1) unaware of climate change (Stage 0); 2) aware of climate change but unsure of its consequences (Stage 1); 3) decided that climate change was not an issue (Stage 2a) or decided that climate change was an issue (Stage 2b); 4) cognizant of climate change solutions (Stage 3b); or 5)

endorsers of specific climate change solutions (Stage 4b). Stamm et al. (2000) often alluded to agenda setting and two-step flow for mass and interpersonal dissemination of climate change causations, but specific theoretical grounding for empirical analysis was not explicated.

Specific hypotheses were not stated, rather, five research questions were posited to uncover: 1) "breadth of [respondent] understanding in terms of causes, consequences, and potential solutions"; 2) respondent stage of engagement with the issue of climate change; 3) the relationship between level of understanding and respondent stage of engagement; 4) the relationship between types of media consumption and/or interpersonal communication regarding climate change and stage of engagement; and 5) types of media which affected respondent understanding of climate change (p. 222).

Pretests were conducted with 100 undergraduates at the University of Washington, from which a refined survey was developed for administration by telephone to Seattle residents. A total of 934 households were selected by use of random digit dialing, of which 512 interviews were completed, and 483 determined coherent and valid for analysis. Likert-type scales were incorporated to measure breadth of understanding and stage of engagement with climate change. Respondents further indicated sources from which they learned about climate change (i.e., either mass or interpersonal communication).

Results uncovered a dispersion of respondents along various stages of engagement with the issue of climate change. Most respondents were either aware of climate change (Stage 1, 22.2%) or had identified climate change as an issue (Stage 2b, 30%). Those who were aware of climate change also expressed sufficient understanding of

anthropogenic causations and possible effects, although fewer respondents expressed consideration for climate change solutions. Standardized partial correlations revealed small but significant positive relationships between television consumption and agriculture as a cause of climate change ($r = .18$, $p < .05$) and family planning as one solution to climate change ($r = .24$, $p < .05$); newspaper consumption and concern for water shortages ($r = .16$, $p < .05$) and social unrest ($r = .19$, $p < .05$); and book consumption and concern for heat waves ($r = .12$, $p < .05$). Consumption of magazines and public radio yielded no significant results. Interpersonal communication increased salience of mitigating aerosol spray use ($r = .16$, $p < .05$) and reduction of home energy use ($r = .18$, $p < .05$).

Contrary to prior research, Stamm et al. (2000) posited sufficient public understanding of anthropogenic climate causations and possible effects, but insufficient thought devoted to climate change solutions. Stamm et al. (2000) further noted the proclivity for interpersonal communication to obfuscate respondent polarity between global warming and ozone layer depletion. Consumption of various media (i.e., "television, newspapers, magazines, and books") was argued to increase respondent salience and understanding of fossil fuel impact, while interpersonal communication increased respondent salience of climate change solutions, "such as driving less, reducing home energy use, and using more energy efficient technology" (p. 234). The authors noted the necessity for further research into the effects of climatological communication and the obfuscation of global warming and ozone depletion.

Arlt et al. (2011) conducted a cross-sectional investigation of the relationship between various media consumption and respondent awareness of anthropogenic climate

change, and subsequent intentions to alter behavior. Prior content analytic investigations of climate change portrayals in various media—and survey research of audience interpretations of such media—were incorporated to inform hypotheses and independent/dependent variables. Specific theoretical grounding was not elucidated, rather, the authors alluded to agenda-setting and selective exposure for substantiation of independent and dependent variable formulation.

Four hypotheses were advanced to uncover impact of media consumption on respondent interpretation of climate change and intention to alter behavior accordingly. Specifically, the authors posited: 1) a positive relationship between media consumption and respondent awareness of anthropogenic climate change; 2) a positive relationship between media consumption and respondent intention to alter behavior; 3) a strong positive relationship between media consumption and awareness of anthropogenic climate change for respondents who expressed interest in political issues; and 4) a strong positive relationship between media consumption and intention to alter behavior among respondents who expressed interest in political issues.

Telephone surveys were administered to 1,414 respondents in Germany who ranged from 16 to 91 years of age. Likert-type scale questions were incorporated to assess frequency of various media consumption, degree of interest in political issues, awareness of climate change and intentions to alter behavior. Demographic control variables were also incorporated to ensure media causation of increased climatological awareness.

Arlt et al. (2011) initially noted climatological awareness among most (65%) respondents and strong intentions to alter behavior through consumption (by acquisition of energy-efficient appliances), and lifestyle changes (by mitigation of travel).

Engagement in *societally relevant activities* (by active environmental political engagement) revealed weak intentions among almost all respondents (97%) to alter behavior in this manner. Interest in political issues was considered high (43%) although most respondents indicated low political competence (94%). Regression analysis uncovered small but significant relationships between various media consumption and climatological awareness. Politically interested respondents who consumed public television news programs expressed a slight increased awareness of anthropogenic climate change ($R^2 = .10$, $p < .05$) over politically uninterested respondents ($R^2 = .06$, $p < .05$). Respondent consumption of weekly print media and climatological awareness were negatively related ($R^2 = -.06$, $p < .05$), although consumption of online informational websites uncovered a small positive relationship ($R^2 = .07$, $p < .05$) among politically interested and uninterested respondents. Behavioral alteration intentionality as the dependent variable did not reveal significant results for television or Internet consumption, but a small significant negative effect for print media consumption ($R^2 = -.07$, $p < .05$).

Overall, Arlt et al. (2011) noted a small but significant increase in awareness of anthropogenic change among respondents who consumed public television news programs over commercial programming, and somewhat stronger relationships for those who expressed interest in political issues. Consumption of informational websites also slightly increased climate change awareness, although behavioral alteration intentionality for television and Internet consumption was not significant. Finally, Arlt et al. (2011) noted a small but significant decrease in climatological awareness and behavioral alteration intentionality for those who consumed weekly print media content. Findings

were considered statistically significant and consistent with suppositions posited in prior content analytic investigations, but indicative of only small effects. As such, Arlt et al. (2011) called for additional investigations of mass and interpersonal communication effects on climatological awareness.

Literature Summary

This chapter explicated pertinent content analyses of climate change portrayals in print media, and investigations of framing effects on audience perceptions of climate change. Content analytic investigations yielded various results but tended to uncover an overall increase in climate change portrayals over time (e.g., Ahchong & Dodds, 2012; Boykoff & Boykoff, 2004; Lieu et al., 2008; Shehata & Hopmann, 2012). Such investigations further uncovered heterogeneous results in regards to portrayals of anthropogenic climate change. In their analysis of Dutch and French publications between 2001 and 2007, Dirikx and Gelders (2010) noted considerably high frequencies of the attribution of responsibility and economic consequences frames. Ahchong and Dodds (2012) noted most articles in the *Toronto Star* and the *Globe and Mail* portrayed climate change as harmful, academically informed and associated directly or indirectly with governmental actors. Boykoff and Boykoff (2004) found that most articles (52.65%) in the *New York Times*, *Los Angeles Times*, the *Washington Post* and the *Wall Street Journal* contained supportive and oppositional arguments of climate change, and that frequency of such coverage increased from 1988 to 2002. Lieu et al. (2008) uncovered frequent depictions of climate change as harmful and connections to potential issues with energy, international cooperation, scientific consensus, macro-economics and

transportation. Further, climate change portrayals that incorporated governmental actors tended to portray the president, as opposed to federal or local agencies. Shehata and Hopmann (2012) noted high climatological article linkage to political institutions in U.S. print media during the Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997) and the United Nations Climate Change Conference at Bali (2007) in the *New York Times* and *Washington Post* (38.2% in the *New York Times* and 36% in the *Washington Post*) compared to Swedish print media (20% in *Dagens Nyheter* and 13.2% in *Svenska Dagbaldet*), although most coverage during the events presented supportive frames of climate change science. Gordon et al. (2010) noted prevalence of the *ecology/science frame* (69.4%), the *consequences frame* (58.3%) and *solutions frame* in the Mexico City newspaper, *Reforma*, between 2004 and 2006. Gordon et al. (2010) further noted the placement of most (59.2%) climatological articles within the first ten pages of the publication, and the increase in climatological article frequency during the Tenth Conference of the Parties at Buenos Aires (December, 2004), and the Eleventh Conference of the Parties at Montreal (December, 2005). Although divergent, the following patterns emerged from the aforementioned content analyses: 1) Average frequencies of climate change portrayals tended to increase over time; 2) climate change portrayals that discussed solution strategies tended to also discuss some form of bureaucracy (both governmental and nongovernmental); and 3) climate change portrayals tended to incorporate discussions of science.

Audience effects investigations also yielded divergent results. Nonetheless, a number of studies uncovered increased awareness of climate change following exposure to various stimuli (e.g., Arlt et al., 2011; Lowe et al., 2006; Stamm et al., 2000). Aside from

the inconsistency of media stimuli, some respondent populations were located in various international locations, such as the United Kingdom (Lowe et al., 2006) or Germany (Arlt et al., 2011), which may have further contributed to result heterogeneity. Corbett and Durfee (2004) uncovered increased respondent certainty of climate change science following exposure to print media stimuli that supported climate change science, as opposed to oppositional or amalgamated supportive/oppositional stimuli. Corbett and Durfee (2004) further noted a positive relationship between respondent certainty of climate change science and time exposed to the supportive stimulus. Morton et al. (2011) noted significant respondent intentions to alter behavior after exposure to stimuli that emphasized the possibility of climate change impacts, regardless of attributes within the stimuli emphasizing uncertainty of such impacts. Nonetheless, their second experiment yielded insignificant respondent intentions to alter behavior after exposure to stimuli that emphasized the possibility of climate change impacts not occurring, regardless of attributes within the stimuli emphasizing uncertainty of such impacts. After respondents were exposed to the film, *The Day After Tomorrow*, Lowe et al. (2006) uncovered respondent distrust in entertainment media portrayals of climate change, but increased belief in anthropogenic causations of climate change and motivations to mitigate environmentally detrimental behaviors. Stamm et al. (2000) uncovered small, positive relationships between various media consumption (i.e., television, newspapers and books) and respondent awareness of fossil fuel impacts, and the proclivity for interpersonal communication to motivate alterations of environmentally detrimental behaviors. Arlt et al. (2011) noted increased awareness of climate change for respondents who consumed public television and informational websites in Germany, and even higher

awareness for those who expressed interest in political issues. Although the aforementioned audience effects investigations yielded somewhat divergent results, the following patterns emerged: 1) Awareness of climate change tended to increase among respondents following administration of various media stimuli; 2) belief in anthropogenic climate change tended not to depend on whether media stimuli were dramatized entertainment or non-dramatized non-entertainment; and 3) respondent intentions to alter behavior tended to occur after exposure to both entertainment and non-entertainment stimuli that portrayed climate change.

Most of the aforementioned investigations did not explicate a theoretical base on which a rationale was devised, which may (to some extent) explain heterogeneous findings. Although not explicitly identified, the reader could interpret the aforementioned content analyses from a perspective of framing theory, where particular aspects of arguments were made "more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (Entman, 1993, p. 52). In this sense, forthcoming content analyses of climate change portrayals should incorporate an increasingly explicit theoretical base from which implications and clearer directions may be delineated. Such an explicit theoretical base for this study, in particular, will adhere to Entman's (1993) conceptualization of framing theory as it pertains to print media portrayals of climate change in the *Las Vegas Review-Journal*.

CHAPTER THREE

METHOD

Content analyses, particularly of climate change portrayals in the media, have incorporated a variety of approaches for data coding and interpretation that have tended to remain quantitative and deductive. Although a number of studies have uncovered the increase of climatological media portrayals in recent years (e.g., Ahchong & Dodds, 2012; Billett, 2010; Boykoff & Boykoff, 2007; Liu, Vedlitz, & Alston, 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zamith, Pinto, & Villar, 2012), some have incorporated exploratory deductive frames and subsequent coding schemes devoid of theoretical grounding and reliable and/or valid measurements (e.g., Boykoff & Boykoff, 2007; Dotson, Jacobson, Kaid, & Stuart, 2012; Takahashi, 2011; Takahashi & Meisner, 2013). For example, Takahashi and Meisner (2013) employed an exploratory deductive coding scheme for the analysis of ten Peruvian newspapers that required coders to identify various—and often amorphous—attributes pertaining to article focus, tone, and the necessity to determine the sources of cited climate change information. Perhaps not surprisingly, Takahashi and Meisner (2013) noted "lower than expected" inter-coder reliability scores that were ultimately not included in the final report. Given the proclivity for some investigations to incorporate exploratory and seemingly unreliable deductive coding schemes, it remains necessary to consider prior research for coding scheme development and implementation for increasingly reliable and valid measurements of climatological portrayals.

The salience of content analytic methods—particularly for the investigation of climate change as portrayed by the media—is relatively high given the increase of

climatological coverage in recent years, and the tendency for emergent audience effects investigations to incorporate content analyses for stimuli design (e.g., Corbett & Durfee, 2004; Lecheler & de Vreese, 2013; Olausson, 2011). Such investigations have appropriated and administered various media stimuli according to general notions of framing theory and frame analysis; a theoretical orientation to which an emerging number of content analyses have explicitly adhered for examinations of climatological portrayals (e.g., Dirikx & Gelders, 2010; Gordon et al., 2010; Nielsen & Kjærgaard, 2011; Shehata & Hopmann, 2012). Originally developed by Goffman (1974) and appropriated (and redefined) by communication scholars (e.g., Entman, 1993), framing theory is generally considered the selection of "some aspects of a perceived reality" which are made "more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (Entman, 1993, p. 52). Since framing theory remains an orientation to which content analysts tend to adhere (implicitly and explicitly), it follows that audience effects investigations will likely continue incorporating such content analytic results for stimuli design. In this sense, content analyzing media portrayals of climate change remains a relevant and appropriate method, so long as reliability and validity remain salient to research design and data interpretation.

According to Babbie (2010), reliability "is a matter of whether a particular technique, applied repeatedly to the same object, yields the same result each time" and validity "refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration" (pp. 150–153). Thus, if a content analytic design is deductive and seeks to uncover the prevalence of particular frames in media portrayals, it

must employ various dimensions that can be applied to different media formats and even subject matter outside of global climate change. In this sense, a particular deductive coding scheme allows the investigator to accurately uncover particular frames within media that portray climate change or other subject matter. Such a coding instrument would provide replicable and accurate assessments pertaining to the presence or absence of particular frames, which would in turn yield increased assurance of reliable and valid findings. Since accurate measurement techniques and generalizability are necessary components of content analytic research, this discussion will incorporate and examine the development of a particular coding scheme that has uncovered the presence or absence of frames in a variety of contexts, and more recently, the examination of climate change portrayals in print media (Dirikx & Gelders, 2010).

Rationale for this Study

Prior analyses have uncovered statistically significant relationships between print media publications and audiences by use of content analysis and open-ended questions (Sampei & Aoyagi-Usui, 2009), revealed attitude effects after exposure to a narrative stimulus by use of surveys and focus groups (Lowe et al., 2006), and examined the effects of varying print media frames on intentionality to mitigate environmentally detrimental behaviors by use of surveys (Morton, Rabinovich, Marshall, & Bretschneider, 2011). Investigations have further examined public interpretations of climate change by use of surveys without the incorporation of media frames as an independent variable (e.g., Bostrom, Morgan, Fischhoff, & Read, 1994; Dunlap, Liere, Mertig, & Jones, 2000; Kellstedt, Zahran, & Vedlitz, 2008; Read, Bostrom, Morgan, Fischhoff, & Smuts, 1994;

Semenza, Ploubidis, & George, 2011). Given the existing literature (and heterogeneous findings), additional contextual insight into portrayals of climate change is necessary, particularly for publications situated in environmentally precarious areas, such as Las Vegas, Nevada.[3] As such, this exploratory investigation will examine print media portrayals of anthropogenic climate change frames in the *Las Vegas Review-Journal* by incorporation of a frame coding scheme developed by Semetko and Valkenburg (2000), and adopted by Dirikx and Gelders (2010) in their analysis of Dutch and French print media coverage of the United Nations Framework Convention on Climate Change. The incorporation of this scheme will provide a reliable and valid descriptive interpretation of climatological frames in the *Las Vegas Review-Journal*, as it allows coders to identify discussions (i.e., frames) of climate change in terms of responsibility, human-interests, conflict, morality and economics.

Hypotheses

As noted earlier regarding framing theory, Entman (1993) defined media frames as the selection of "some aspects of a perceived reality" which are made "more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (p. 52). In this regard, scholars have uncovered the longitudinal proclivity for particular climatological portrayals, or frames, to increase across a variety of regional, national and international publications, and subsequently yield frame heterogeneity that includes associations of climate change to economic decline, political bureaucratic

[3] See Chapter One, p. 6, for a brief discussion of environmental precariousness in the desert southwest, and particularly Las Vegas, Nevada.

institutions and/or individuals, non-bureaucratic groups, and scientific organizations (e.g., Ahchong & Dodds, 2012; Billett, 2010; Boykoff & Boykoff, 2007; Liu, et al., 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zamith et al., 2012). As such, the following are posited:

H_1: Portrayals of anthropogenic climate change in the *Las Vegas Review-Journal* will increase from 1997 to 2014.

H_2: Article incorporation of the *attribution of responsibility* frame will increase over time and appear with greater magnitude than the *human interest* frame, *conflict* frame, *morality* frame, or *economic consequences* frame.

H_3: As presence of the *attribution of responsibility* frame increases, presence of the *economic consequences* frame will also increase and with greater magnitude than the *human interest* frame, *conflict* frame, or *morality* frame.

H_4: As presence of the *human interest* frame increases, presence of the *morality* frame will also increase and with greater magnitude than the *economic consequences* frame, *attribution of responsibility* frame, or *conflict* frame.

H_5: As presence of the *conflict* frame increases, presence of the *economic consequences* frame will also increase and with greater magnitude than the *attribution of responsibility* frame, *human interest* frame, or *morality* frame.

Sampling

Prior content analytic investigations of anthropogenic climate change have employed digital databases for article attainment, such as Lexis-Nexis, National Newspaper Index and/or ABI/Inform and keywords such as *global warming*, *global climate change*, *climate change*, *greenhouse gas* and/or *greenhouse gases* (e.g., Antilla, 2005; Boykoff & Boykoff, 2004; Dotson et al., 2012; Gordon et al., 2010; Liu et al., 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zehr, 2000). As such, this investigation employed the digital database, NewsBank, to attain climatological articles from the *Las Vegas Review-Journal* by use of the keywords *global warming*, *climate change* and *greenhouse gas*. A single search containing the aforementioned keywords initially yielded 1,199 articles—including opinion articles, interviews, commentaries and news content—between January 1997 and September 2014. Limitations with time curtailed article collection from 2014 to nine months (January to September), while database limitations did not provide access to articles prior to 1997. Nonetheless, such a time frame provides an exhaustive representation of the frequency of climatological frame portrayals within a period where prior investigations have noted increased frequencies of coverage (e.g., Ahchong & Dodds, 2012; Billett, 2010; Liu et al., 2008; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013; Zamith, Pinto, & Villar, 2012). Finally, climatological articles (the units of analysis in this investigation) were read entirely during the coding process and subsequently eliminated if irrelevant, or if none of the aforementioned keywords were present in the text. Following the coding process, 88 articles were omitted from the sample for one (or both) of the reasons noted above, which resulted in a final sample of 1,111 articles.

Measures

Climatological Frames

The climatological frames detailed below contain between three and five questions to which coders answered *yes* (present, 1) or *no* (not present, 0) to assess the overall presence or absence of a particular frame (hereinafter referred to as *magnitude*). Specifically, the attribution of responsibility and human interest frames contain five questions, the conflict frame contains four questions, and the morality and economic consequences frames each contain three questions. Semetko and Valkenburg (2000) and Dirikx and Gelders (2010) noted the attribution of responsibility, human interest, and conflict frames were exploratory, and thus incorporated more than three questions in order to ensure exhaustive frame measurements and increase inter-coder reliability by exclusion of extra questions, if necessary. Further, questions were modified (as indicated by brackets) from previous studies in order to explicitly address climate change (see Tables 1 and 2 for questions). Although incorporations of Likert-type scales have emerged to assess the degree to which a particular question is present or absent (e.g., Dirikx & Gelders, 2010), the overwhelming majority of studies have retained binary (yes, no) answering methods that have consistently yielded acceptable rates of inter-coder reliability (e.g., d'Haenens & de Lange, 2001; De Vreese, Peter, & Semetko, 2010; Kline, Karel, & Chatterjee, 2006; Semetko & Valkenburg, 2000).

Attribution of Responsibility Frame

The *attribution of responsibility* frame was developed and incorporated in order to assess whether media portrayed "an issue or problem in such as way as to attribute

responsibility for its cause or solution to either the government or to an individual or group" (Semetko & Valkenburg, 2000, p. 96). Prior research was incorporated to substantiate the development of this particular frame in Semetko and Valkenburg's (2000) study, which was exploratory, but nonetheless drawn from a typology developed by Iyengar (1987) that identified salient frames through in-depth respondent interviews following exposure to various media stimuli. Generally, Iyengar (1987) noted the tendency for respondents to attribute specific causal reasoning to particular phenomena portrayed in such stimuli, and shift such causal reasoning depending on stimuli context. For example, if a media portrayal of unemployment focused on the national unemployment rate, there emerged a proclivity for respondents who received that particular stimulus to attribute unemployment to economic conditions. Although exploratory, Semetko and Valkenburg (2000) noted the salience of this finding in Iyengar's (1987) investigation, and thus incorporated this frame for deductive analysis. As such, this investigation retained the attribution of responsibility frame and its conceptual definition as noted by Semetko and Valkenburg (2000).

Human Interest Frame

The *human interest* frame was incorporated in order to identify the degree to which a particular media portrayal "brings a human face or an emotional angle to the presentation of an event, issue, or problem" (Semetko & Valkenburg, 2000, p. 95). Prior research noted the tendency for media firms "to produce a product that captures and retains audience interest" by the attribution of narratives to human or seemingly personalized elements (Semetko & Valkenburg, 2000, p. 96). Precipitated by increased

macroeconomic conditions pertaining to competition, prevalence of the human interest frame was determined salient and a potential dynamic to which media firms were expected to appeal. This conceptual definition of the human interest frame was retained for data collection.

Conflict Frame

The *conflict frame* was incorporated in order to categorize media portrayals of "conflict between individuals, groups, or institutions as a means of capturing audience interest" (Semetko & Valkenburg, 2000, p. 95). Prior analyses uncovered reductionist qualities of media portrayals, specifically during political events, where complex topics were reduced "to overly simplistic conflict" between political actors (Semetko & Valkenburg, 2000, p. 95). This frame was especially relevant to media portrayals of political elections, as noted by Patterson (1993). Thus, incorporation of the conflict frame allowed coders to assess the degree to which media portrayals contributed to the reduction of issues, be they political or non-political. Thus, the conflict frame, and the conceptual definition developed by Semetko and Valkenburg (2000), was retained in this study.

Morality Frame

The *morality* frame was incorporated in order to identify whether media portrayals contextualized a particular event in terms "of religious tenets or moral prescriptions" (Semetko & Valkenburg, 2000, p. 96). Prior research noted the tendency for some media firms and/or individual journalists to disregard the "norm of objectivity" by including

religious or moral frames "indirectly—through quotation or inference, for instance—[or] by having someone else raise the question" (Semetko & Valkenburg, 2000, p. 96). Primarily drawn from the work of Neuman (1992), Semetko and Valkenburg (2000) incorporated this frame in order to uncover the degree to which certain topics were portrayed as inextricable from religious institutions, individuals, and/or qualities. As such, this investigation retained the morality frame and its conceptual definition as noted by Semetko and Valkenburg (2000).

Economic Consequences Frame

The *economic consequences* frame was incorporated in order to assess whether media coverage portrayed "an event, problem or issue in terms of the consequences it will have economically on an individual, group, institution, region, or country" (Semetko & Valkenburg, 2000, p. 96). Results from prior investigations, particularly those of Neuman (1992), noted the salience of media coverage that was often contextualized in terms of economic impacts. In turn, Semetko and Valkenburg (2000) noted the necessity to incorporate a frame for the identification of media portrayals contextualized in terms of economic impacts, as such coverage was considered to remain salient. Thus, the economic consequences frame, and the conceptual definition developed by Semetko and Valkenburg (2000), was retained in this study.

Article Scope

In order to further assess discussions of climate change situated in the desert southwest, geographic regions discussed in each article were coded accordingly.

Although relatively few studies examining climate change portrayals have considered references to particular geographic areas, this analysis followed the direction of Liu et al. (2008) by noting specific areas in terms of state and national boundary lines as opposed to general areas such as the desert southwest, Mojave Desert or the Colorado River basin. Such an approach is particularly relevant to political discourses of climate change (e.g., Liu et al., 2008) and the political orientations from which the coding scheme in this study was developed (d'Haenens & de Lange, 2001; De Vreese et al., 2010; Dirikx & Gelders, 2010; Kline et al., 2006; Semetko & Valkenburg, 2000). Specifically, article scope consisted of any, or all, of the following: *regional* (Southern Nevada specifically); *national* (any area[s] outside Southern Nevada and within the 48 contiguous states, Alaska and Hawaii); and/or *international* (any area[s] outside the 48 contiguous states, Alaska and Hawaii).

Pilot Test of the Coding Instrument and Instructions

Prior to coder training, a pilot test was conducted to assess the clarity and effectiveness of coder instructions among 18 undergraduate students in a summer research methods class at the University of Nevada, Las Vegas. Prior to administration of the pilot exercise, two example articles (one news article and one editorial) were deliberately selected from the NewsBank database and coded by the investigator to provide an example of article interpretation (see Appendix I for example articles with coding rationale). To increase clarity of coding rationale, footnote numbers were inserted next to each *yes* answer where students could refer to full, detailed coding explanations on a separate footnotes page (Appendix I). Following a brief discussion of various coding

rationales, two additional news articles (also deliberately selected by the investigator) were distributed to all 18 students, in addition to code sheets and instructions that introduced the concept of frames in print media, the presence (or absence) of particular frames, and discussions of geographic scope (see Appendix II for pilot test articles). Students were also encouraged to provide feedback on frame questions, or definitions, that were incorporated into revisions of the instructions following the pilot test. Specifically, such revisions included explicit distinctions between *regional*, *national* and *international* publications, and clarification of three questions within the human interest frame (see Appendix III for final coding instrument and instructions).[4]

Following completion of the exercise, data were compiled to uncover general tendencies of (dis)agreement between participants for each individual article. Given the notably small sample size of two articles among 18 distinct coders, pairwise percentage agreements were calculated among the participants for each frame question and article. Pairwise percentage agreements reveal the "percent agreement between each possible pair of coders" regardless of units of analysis (Freelon, 2010, p. 27). Existing measurements that assess inter-coder reliability among three or more coders (e.g., Krippendorff's alpha, Fleiss' kappa) were not incorporated due to the low number of total cases assessed during the pilot test that subsequently yielded negative kappa scores, and alpha scores of zero, regardless of perfect pairwise percentage agreements (100.0%) between all 18 coders. In this regard, the assessment of only two articles (whether individually or combined) consistently yielded alpha scores of zero, and expected

[4] Questions that required additional clarification were the following: Does the story provide a human example or "human face" on climate change? Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion? Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?

agreement kappa scores that exceeded observed agreement scores, and subsequently, negative kappa values. Given the consistency of this result across various questions and levels of percent agreement, such scores were determined an unreliable assessment for uncovering the general results of the pilot test, and replaced with pairwise percentage agreements (Freelon, 2010). Although many scholars have noted the detriments of incorporating any variations on percentage agreement calculations (e.g., Hughes & Garrett, 1990; Kolbe & Burnett, 1991; Krippendorff, 2004; Lombard, Snyder-Duch, & Bracken, 2002; Scott, 1955), pairwise percentage agreements were used to uncover a general tendency of training effectiveness among a variety of participants within a short period of time, and thus provided a rough approximation of the (dis)agreement tendencies following such training in a classroom setting.

Pilot test results for each article are detailed in Tables 1 and 2, where total *yes* and *no* answers are listed for each frame question, followed by pairwise percentage agreements. Although heterogeneous on the surface, the results in Tables 1 and 2 reveal particular attributes of the participants when coding obvious, or less obvious, latent content. The majority of agreement percentages above 70.0% in both articles occurred when students declared an attribute not present, answering *no* to a given question. On the other hand, consensus diverged when less obvious, latent features emerged (see Table 1: Attribution of Responsibility Frame, Questions 1 and 3; Economic Consequences Frame, Questions 1 and 3; Human Interest Frame, Question 2; Table 2: Attribution of Responsibility Frame, Questions 1 and 3; Human Interest Frame, Questions 1, 2, 5; and Conflict Frame, Question 1 and 3). Uncertainty when faced with less obvious, latent content seems likely given the majority of agreement that occurred when obvious, latent features emerged,

such as the explicit discussion of economic consequences in Article Two (Table 2, Economic Consequences Frame, Questions 1, 2, 3). Given the brief time in which students were trained for this exercise, results may suggest that exhaustive training is required to familiarize coders with procedures, particularly when faced with less obvious latent content that caused consensus divergence in the pilot test. Thus, coding procedures for this study were modified to extend training times and discussions of constructs, from which less obvious, latent features, could be recognized and reliably coded. Finally, as noted earlier, definitions of article scope were revised according to student feedback, although not included in the pilot test to assess percentage agreement.

Table 1

Respondent Answers and Pairwise Percent Agreements for Article One

Frame	Answers		Pairwise Percent Agreement
	Yes	*No*	
Attribution of Responsibility			
1. Does the story suggest that some level of government has the ability to alleviate [climate change]?	11	7	49.67
2. Does the story suggest that some level of the government is responsible for [climate change]?	2	16	79.08
3. Does the story suggest solution(s) to the problem/issue?	10	8	47.71
4. Does the story suggest that an individual (or group of people in society) is responsible for [climate change]?	3	15	79.08
5. Does the story suggest that [climate change] requires urgent action?	15	3	63.39
Human Interest			
1. Does the story provide a human example or "human face" on [climate change]?	4	14	63.39
2. Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	6	12	52.94
3. Does the story emphasize how individuals and groups are affected by [climate change]?	16	2	79.08
4. Does the story go into the private or personal lives of the actors?	0	18	100.00
5. Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	4	14	63.39
Conflict			
1. Does the story reflect disagreement between political parties-individuals-groups-countries?	1	17	88.88
2. Does one party/individual/group/country reproach another?	3	15	70.58
3. Does the story refer to two sides or more than two sides of [climate change]?	5	13	57.51
4. Does the story refer to winners and losers?	1	17	88.88
Morality			
1. Does the story contain any moral message?	0	18	100.00
2. Does the story make reference to morality, God, and other religious tenets?	0	18	100.00
3. Does the story offer specific social prescriptions about how to behave?	1	17	88.88
Economic Consequences			
1. Is there a mention of financial losses or gains now or in the future?	12	6	52.94
2. Is there a mention of the costs/degree of expense involved?	16	2	79.08
3. Is there a reference to economic consequences of pursing or not pursing a course of action?	10	8	49.67

Table 2

Respondent Answers and Pairwise Percent Agreements for Article Two

Frame	Answers		Pairwise Percent Agreement
	Yes	*No*	
Attribution of Responsibility			
1. Does the story suggest that some level of government has the ability to alleviate [climate change]?	12	6	52.94
2. Does the story suggest that some level of the government is responsible for [climate change]?	0	18	100.00
3. Does the story suggest solution(s) to the problem/issue?	8	10	47.71
4. Does the story suggest that an individual (or group of people in society) is responsible for [climate change]?	1	17	88.88
5. Does the story suggest that [climate change] requires urgent action?	17	1	88.88
Human Interest			
1. Does the story provide a human example or "human face" on [climate change]?	8	10	47.71
2. Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	6	12	52.94
3. Does the story emphasize how individuals and groups are affected by [climate change]?	18	0	100.00
4. Does the story go into the private or personal lives of the actors?	2	16	79.08
5. Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	7	11	49.67
Conflict			
1. Does the story reflect disagreement between political parties-individuals-groups-countries?	5	13	57.51
2. Does one party/individual/group/country reproach another?	3	15	70.58
3. Does the story refer to two sides or more than two sides of [climate change]?	6	12	52.94
4. Does the story refer to winners and losers?	2	16	79.08
Morality			
1. Does the story contain any moral message?	2	16	79.08
2. Does the story make reference to morality, God, and other religious tenets?	0	18	100.00
3. Does the story offer specific social prescriptions about how to behave?	1	17	88.88
Economic Consequences			
1. Is there a mention of financial losses or gains now or in the future?	17	1	88.88
2. Is there a mention of the costs/degree of expense involved?	18	0	100.00
3. Is there a reference to economic consequences of pursing or not pursing a course of action?	15	3	70.58

Assessing Reliability and Justification for Scott's π

Lombard, Snyder-Duch, and Bracken (2002) noted that "[i]ntercoder reliability is assessed by having two or more coders categorize units (programs, scenes, articles, stories, words etc.), and then using these categorizations to calculate a numerical index of the extent of agreement between or among coders" (p. 590). If two or more separate coders establish an acceptable level of reliability within a given index, or indices, then reproduction of acceptable reliability levels among different coders with the same training is likely: "reproducibility is arguably the most important interpretation of reliability" (Krippendorff, 2004, p. 414).

Although selection of particular statistics for calculating inter-coder reliability remains a topic of debate among statisticians (e.g., Hughes & Garrett, 1990; Krippendorff, 2004; Lombard et al., 2002), this analysis incorporated a procedure ideal for assessing nominal data that further accounts for chance agreement and consistent disagreements between two coders: Scott's (1955) π. Despite the purveyance of Cohen's (1960) κ among content analysts to assess reliability, κ has been found to "ignore the disagreements between the coders' use of categories; it adds them to the measure as an agreement" (Krippendorff, 2004, p. 420). In essence, proclivities for coders to provide consistent, and at times, divergent answers across different constructs may inflate κ. Thus, the use of κ to assess reliability was disregarded. The use of Krippendorff's (1970) α was also disregarded, such that α is an inappropriate metric to assess nominal data: "Alpha (α) applies to metrics other than nominal" (Krippendorff, 2004, p. 423). Thus, Scott's (1955) π was selected as an appropriate statistic to assess reliability between two

coders of nominal data. Finally, although some have argued Scott's (1955) π a "conservative" index that has, at times, yielded reliability scores lower than κ or α (Lombard et al., 2002), generally accepted reliability levels for exploratory investigations were retained. Thus, levels yielded below .70 were determined unreliable.

Coder Training

A separate coder was selected and trained according to the refined directions and instructional requirements suggested by the pilot test. The investigator introduced the coder to the project, the constructs under investigation, and example codes according to the directions (see Appendix III for directions and coding instrument). Emphasis on recognitions of less obvious, latent items were discussed and demonstrated by use of example articles selected by the investigator. Once discussions of less obvious, latent items reached a point of consistent recognition, the official coding process commenced.

Inter-Coder Reliability Scores

Two coders (including the investigator) examined an initial sample of 130 articles (11.7%) to determine inter-coder reliability of climate change frame constructs, and discussions of geographic scope. Table 3 details the reliability scores in which all questions but one in the human interest frame (Does the story emphasize how individuals and groups are affected by climate change?) yielded acceptable scores above .70. Thus, the third question in the human interest frame was eliminated from further analysis. The remaining (1,069) articles were coded by the investigator.

Table 3

Scott's π Inter-Coder Reliability Scores

Frame	π (N = 130)
Attribution of Responsibility	
1. Does the story suggest that some level of government has the ability to alleviate [climate change]?	.96
2. Does the story suggest that some level of the government is responsible for [climate change]?	.82
3. Does the story suggest solution(s) to the problem/issue?	.95
4. Does the story suggest that an individual (or group of people in society) is responsible for [climate change]?	.79
5. Does the story suggest that [climate change] requires urgent action?	.86
Human Interest	
1. Does the story provide a human example or "human face" on [climate change]?	.93
2. Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	.76
3. Does the story emphasize how individuals and groups are affected by [climate change]?	.66
4. Does the story go into the private or personal lives of the actors?	.80
5. Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	.82
Conflict	
1. Does the story reflect disagreement between political parties-individuals-groups-countries?	.98
2. Does one party/individual/group/country reproach another?	.90
3. Does the story refer to two sides or more than two sides of [climate change]?	.95
4. Does the story refer to winners and losers?	.86
Morality	
1. Does the story contain any moral message?	.91
2. Does the story make reference to morality, God, and other religious tenets?	.78
3. Does the story offer specific social prescriptions about how to behave?	.71
Economic Consequences	
1. Is there a mention of financial losses or gains now or in the future?	.96
2. Is there a mention of the costs/degree of expense involved?	.88
3. Is there a reference to economic consequences of pursing or not pursing a course of action?	.96
Geographic Scope	
Discussions of regional, national, and/or international areas.	.91

Reliability and Validity

The particular coding instrument incorporated into this study has been employed by a number of scholars in order to examine media portrayals of adoption (Kline et al., 2006), asylum seekers (d'Haenens & de Lange, 2001), climate change (Dirikx & Gelders, 2010), and European politics (De Vreese, Peter, & Semetko, 2010; Semetko & Valkenburg, 2000). Such examinations have yielded acceptable rates of inter-coder reliability despite subject heterogeneity, which has also afforded scholars the ability to engage statistical procedures such as factor analysis (d'Haenens & de Lange, 2001; Dirikx & Gelders, 2010; Semetko & Valkenburg, 2000), multivariate analysis of variance (MANOVA) (Kline et al., 2006), and the use of a descriptive visibility scale (usually from 0 to 1, or from 1 to 3) to examine the degree to which particular frames are present or absent within the sampled time period (e.g., De Vreese et al., 2010; Dirikx & Gelders, 2010; Semetko & Valkenburg, 2000).[5] Generally, such procedures have yielded statistically significant results where levels of probability, in regards to factor analysis and MANOVA, have remained below .05 (e.g., d'Haenens & de Lange, 2001; Dirikx & Gelders, 2010; Kline et al., 2006; Semetko & Valkenburg, 2000), and have thus revealed findings worth additional consideration for epistemological contribution.

Although application of the coding scheme to analyze portrayals of climate change in a regionally distributed newspaper remains exploratory, acceptable reliability scores suggest reproducibility, while application of the coding scheme to myriad contexts suggests validity to uncover the presence of constructs related to responsibility, human

[5] Higher visibility scores yielded were generally in the ranges between 0 and 1 or between 1 and 3. Higher scores in such scales have indicated increased visibility of a particular frame throughout the entire period of time under investigation.

interest narratives, conflict, moral issues and economic conditions. In turn, such constructs may inform general communication phenomena surrounding global climate change, and thus contribute to the validity, and epistemology, of mediated climate change discussions.

Analysis Plan

Chapter Four will provide a general description of the content analytic results. First, descriptive statistics of climatological portrayals will be reported to uncover article frequency over time, followed by an analysis of *computed variables* to assess the magnitude of frame presence over time (with significance testing using an analysis of variance [ANOVA]), and discussions of geographic scope and article positioning between 1997 and 2014 by use of descriptive tables. Hypotheses one through five will be tested by use of frequencies and Pearson product-moment correlation coefficients, followed by extended analyses to uncover patterns of article source and authorship among various article types by use of descriptive tables.

Chapter Five will provide a general discussion and interpretation of the findings reported in the previous chapter that will include implications for existing content analytic and audience investigations. Finally, strengths, weaknesses and recommendations for future research will be discussed.

CHAPTER FOUR

RESULTS

General Description

The aim of this investigation has been to uncover the presence of particular climatological frames, and additional characteristics, published in the *Las Vegas Review-Journal* between 1997 and 2014. Articles analyzed within this time reveal the following: 1) climate change coverage increased with frequency between 1997 and 2007, but decreased from 2008 to 2014; 2) climate change was framed in terms of conflict most frequently, and with greatest magnitude, followed by the economic consequences frame, attribution of responsibility frame, human interest frame, and morality frame; 3) most climatological articles remained focused on the southwestern United States (36.2%), the United States at large (23.5%), or both the southwest and the United States at large (21.1%); and 4) most climatological articles (80.9%) appeared on pages and sections subsequent to the first (i.e., section A, page 1). The following sections will explore the aforementioned results with detail, and answer the five hypotheses posited in the previous chapter, followed by extended analyses of article sources and authorship at the conclusion of this chapter.

Table 4

Articles Published per Year

Year	Number of Articles	Percent
1997	7	0.6%
1998	6	0.5%
1999	5	0.5%
2000	4	0.4%
2001	3	0.3%
2002	12	1.1%
2003	10	0.9%
2004	17	1.5%
2005	33	3.0%
2006	59	5.3%
2007	195	17.6%
2008	190	17.1%
2009	143	12.9%
2010	85	7.7%
2011	69	6.2%
2012	62	5.6%
2013	64	5.8%
2014	147	13.2%
Total	1,111	100.0%

Article Publication Frequency

The sample for this study consists of 1,111 newspaper articles retrieved from the NewsBank database containing the keywords *global warming*, *climate change*, and/or *greenhouse gas*. Table 4 reveals the frequency of article publication between 1997 and

2014, with an increasing trend of climatological articles published between 1997 and 2007, and a decreasing trend from 2008 to 2014. In this regard, the years in which climatological articles were most frequently published include 2007 (17.6%), 2008 (17.1%), 2009 (12. 9%), and 2014 (13.2%). Although publication frequency declined between 2008 and 2013, annual publications discussing climate change remained above 61 articles per year. Indeed, this is considerably higher than the previous years between 1997 and 2005, where annual publications discussing climate change remained between seven and 33.

Magnitude of Frame Presence

As noted in Chapter Three, variables for each particular frame were combined to render *computed variables* to assess the magnitude of frame presence over time. Figure 1 visualizes the mean number of *yes* answers within each frame, for each year. Higher annual values are indicative of greater *yes* answers, and thus, greater presence. Scores may range from 0 (not present) to 3 (present) for the morality and economic frames; 0 (not present) to 4 (present) for the human interest and conflict frames; and 0 (not present) to 5 (present) for the attribution of responsibility frame. Nonetheless, no frames ever reach an annual presence magnitude above 2.5.

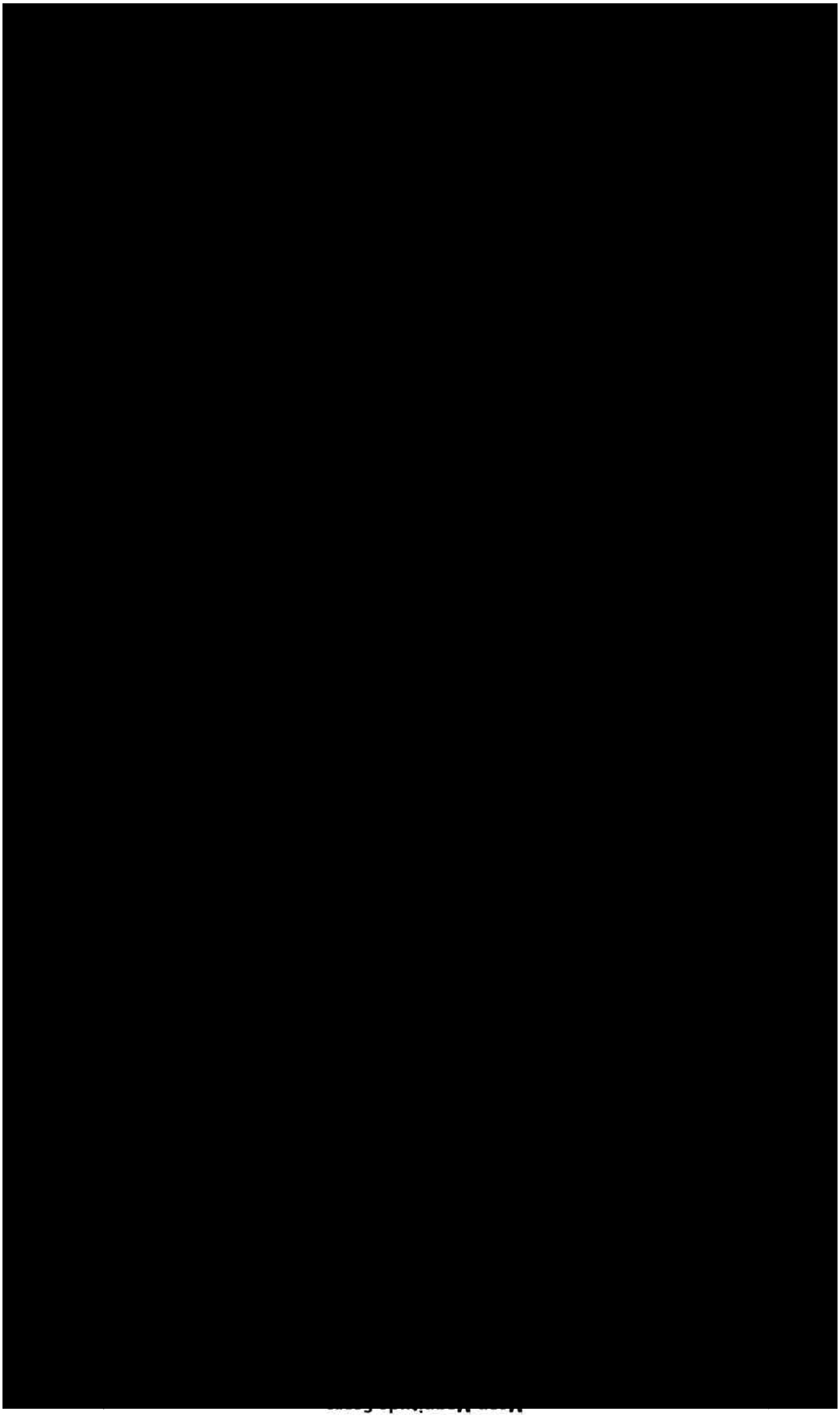


Figure 1 reveals the consistent presence of conflict, particularly between 2006 and 2013 with mean magnitude scores between 1.4 (2006) and 1.9 (2011). Economics also remains consistently present, and increases between 2001 and 2014 with mean magnitude scores between 0 (2001) and 1.5 (2013). Figure 1 further reveals an increase of human interest dimensions beginning in 2003, with magnitude scores ranging from 0.1 (2003) to approximately 1.5 (2014). Further, presence of the attribution of responsibility frame remains relatively consistent throughout the time-period, yielding a magnitude score above 2 in 1997, and remaining between 0.5 and 1.5 from 2000 to 2014. Finally, presence of the morality frame remains consistently low, never yielding magnitude levels above 0.5 between 1997 and 2014.

Table 5

One-Way ANOVA on the Magnitude of Frame Presence

Frame (N = 1,111)	Mean	Std. Deviation	F
Attribution of Responsibility	0.91	1.11	2.666***
Human Interest	0.89	1.11	7.644***
Conflict	1.55	1.26	1.981**
Morality	0.23	0.52	1.270
Economics	1.12	1.16	2.216**

*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

A one-way analysis of variance (ANOVA) was conducted in order to assess the levels of statistical significance between the computed frame variables from 1997 to 2014. Table 5 indicates statistically significant differences over time between the attribution of responsibility frame ($F = 2.666$, $p = .00$), human interest frame ($F = 7.644$, $p = .00$), conflict frame ($F = 1.981$, $p = .01$), and economic frame ($F = 2.216$, $p = .003$), but an insignificant statistical difference compared to the morality frame ($F = 1.27$, $p = .203$). The mean magnitude scores of the morality frame (Figure 1) indeed remain relatively low in comparison to the other frames, which may contribute to its statistical insignificance. On the other hand, Table 5 reveals a particularly high F score for the human interest frame ($F = 7.644$, $p = .00$) which may be associated with its continual ascendency between 2001 and 2014 in Figure 1, where the lowest mean magnitude scores yielded continually increase beyond those in preceding years.

Geographic Scope

Climatological articles were coded according to whether any (or all) of the following geographic regions were referenced: *regional* (Southern Nevada specifically) and/or *national* (any area[s] outside Southern Nevada and within the 48 contiguous states, Alaska and Hawaii) and/or *international* (any area[s] outside of the 48 contiguous states, Alaska and Hawaii). Articles that did not reference a specific geographic region were also coded accordingly, and are noted in Table 6. Overall, 1,031 articles (92.8%) referenced specific or general geographic areas, and 80 (7.2%) did not refer to any specific or general geographic areas.

Table 6

Geographic Scope

Scope	Number of Articles	Percent
Regional	373	33.6%
National	242	21.8%
Regional and National	218	19.6%
National and International	82	7.4%
No Geographic Area(s) Mentioned	80	7.2%
Regional, National and International	66	5.9%
International	30	2.7%
Regional and International	20	1.8%
Total	1,111	100.0%

The majority of climatological articles (90.1%) referred to areas in the United States, whether such areas were specifically regional (33.6%), national (21.8%), regional and national (19.6%), or incorporated references to international areas (national and international, 7.4%; regional, national and international, 5.9%; regional and international, 1.8%). Although specific references to international areas were negligible (2.7%), such areas remained present in 198 articles (17.8%), which may be particularly notable given the prevalence of regional and national articles. Thus, geographic scope associated with climate change remained primarily an issue situated in Southern Nevada and United States at large, and secondarily an issue affecting various international regions outside of the United States. Given that the *Las Vegas Review-Journal* is a regionally distributed newspaper in Southern Nevada, perhaps such results should be expected.

Table 7

Starting Page of Article, Most Frequently Occurring Sections

Page (N = 1,055)	Number of Articles	Percent
B6	108	10.2%
B1	96	9.1%
D1	94	8.9%
D3	78	7.4%
B8	75	7.1%
B10	56	5.3%
D2	52	4.9%
A1	46	4.4%
D4	46	4.4%
B3	43	4.1%
B2	36	3.4%
B5	31	2.9%
B7	31	2.9%
B9	27	2.6%
B4	22	2.1%
A3	19	1.8%
E1	17	1.6%
B12	13	1.2%
E2	11	1.0%
Remaining sections and pages	154	14.7%
Total	1,055	100.0%

Note. The amalgamated category, *remaining pages and sections*, comprises of page numbers on which fewer than 11 articles (1.0%) appeared between 1997 and 2014.

Starting Page of Article

Initiating page numbers were collected from the NewsBank database to identify patterns of article positioning—in the printed, physical *Las Vegas Review-Journal*—between 1997 and 2014. Although particular attributes of specific sections were not available for analysis (e.g., whether B2 indicates a page in the "Nevada" section, or "Sports" section), page numbers were analyzed according to the letter (e.g., "A" indicative of the first section) and subsequent number (e.g., "2" indicative of the second page in a particular section).[6] Articles without page and section information were considered missing and subsequently omitted from the descriptive counts in Table 7. Overall, 1,055 articles (95%) contained starting page information, whereas 56 articles (5.0%) did not contain such information and were thus omitted from Table 7.

In order to uncover general tendencies of article placement between 1997 and 2014, pages on which fewer than 11 articles (1.0%) appeared were amalgamated into a single category (*remaining sections and pages*) that comprises of 154 articles (14.7% of articles with starting page information). Thus, Table 7 details the specific pages on which the majority of articles appeared (901 articles, 85.3% of articles with starting page information).

The distribution of articles in Table 7 reveals particular attributes of positioning between 1997 and 2014. Although all articles detailed in Table 7 were positioned in sections A, B, D or E, almost half (50.9%) were situated in section B, of which 442 articles (41.8%) were situated on pages between B2 and B12, and 96 articles (9.1%) situated on page B1. Regardless of section placement (i.e., whether sections A, B, D or

[6] For example, "A2" represents an article positioned on the second page (2) in the first section (A), whereas "C4" represents an article positioned on the fourth page (4) of the third section (C).

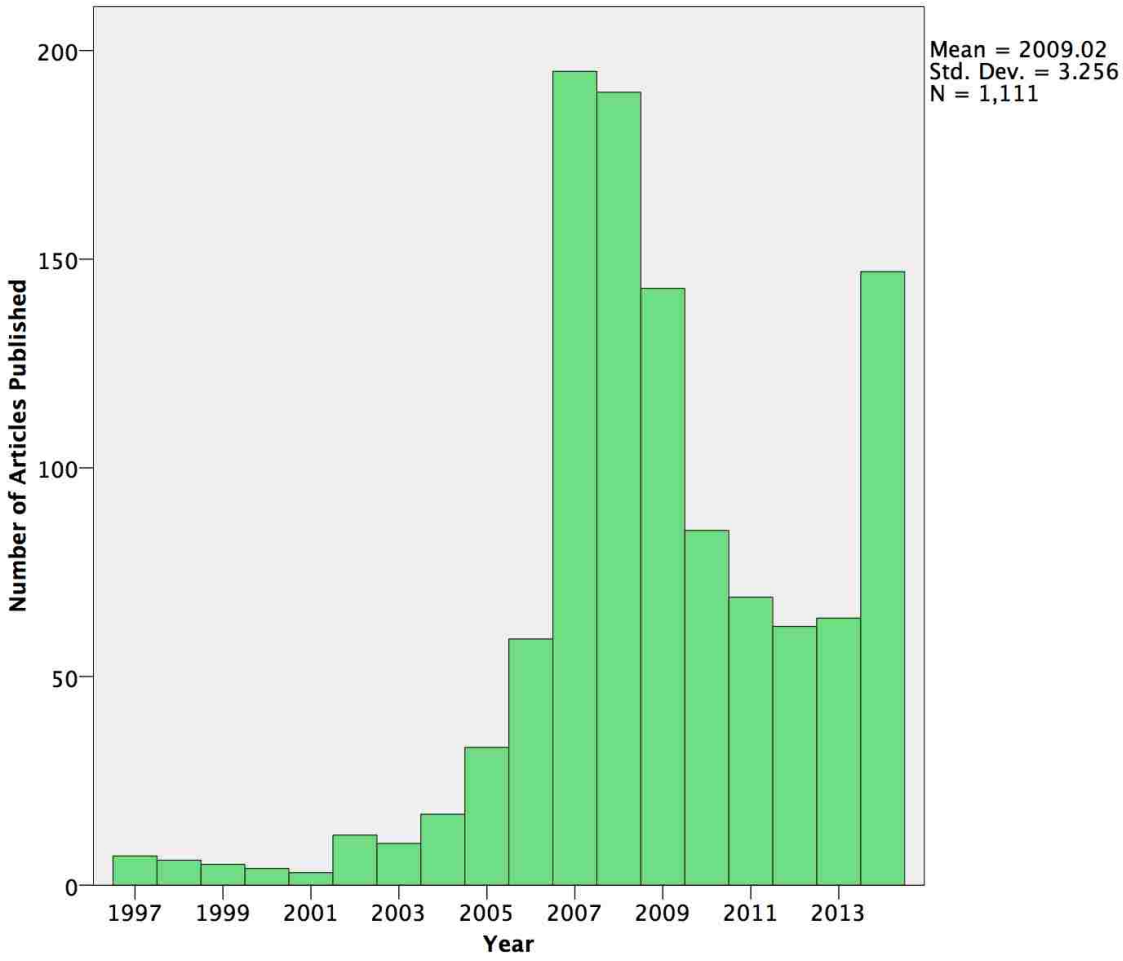
E), most articles in Table 7 (61.3%) appeared on pages succeeding the first, between two and 12, and thus fewer articles (24.0%) appeared on the first page of any section. Further, articles placed in the initial section (A) remained minimal (6.2%), particularly regarding articles situated on the first page, of the first section: A1 (4.4%). In other words, 855 articles (80.9%) were positioned on pages succeeding A1. Although a considerable number of articles appeared on the first page of sections A, B, D and E (24.0%), discussions of climate change largely remained situated on pages subsequent to A1.

Hypothesis One

The findings for this investigation provide no support for hypothesis one. Recall hypothesis one: Portrayals of anthropogenic climate change in the *Las Vegas Review-Journal* will increase from 1997 to 2014. Although general levels of publication frequency increased between 1997 and 2014, such increases were not incremental, nor consistent, and largely declined after 2008. Figure 2 visualizes the frequency of publications between 1997 and 2014, and reveals various oscillations during the period under investigation. Indeed, publication frequency declined from 1997 to 2001, increased substantially from 2003 to 2007, declined from 2008 to 2012, and increased from 2013 to 2014. As noted in the previous section (General Description), average levels of publication frequency remained higher following 2008, although annual publications declined markedly. Nonetheless, such findings do not support the hypothesized incremental increases in article publication frequency, despite increases of annual averages. Thus, hypothesis one is not supported.

Figure 2

Histogram of Article Publication Frequency per Year



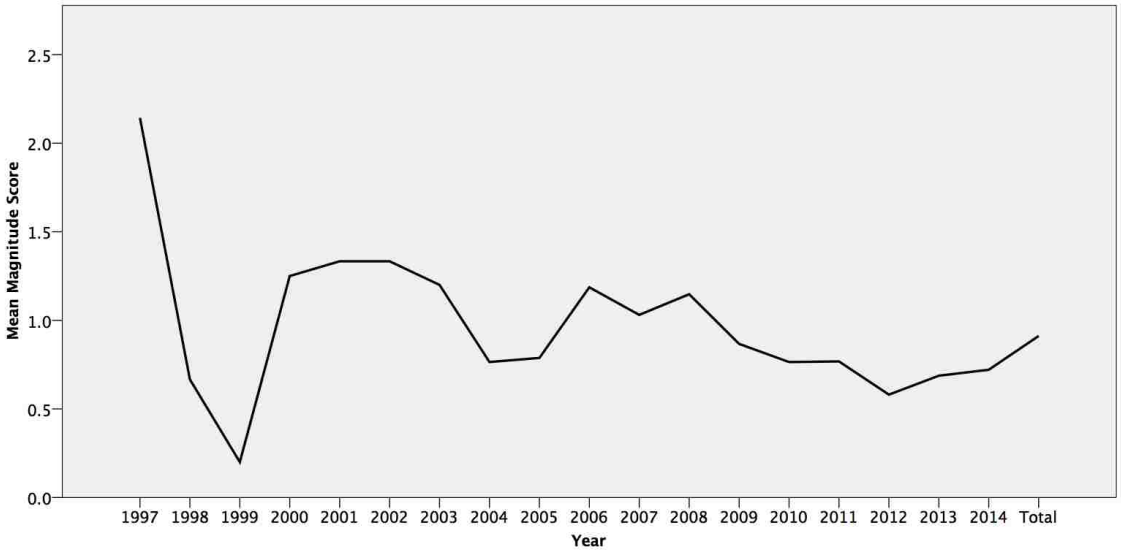
Hypothesis Two

The findings provide no support for hypothesis two. Recall hypothesis two: Article incorporation of the *attribution of responsibility* frame will increase over time, and appear with greater magnitude than the *human interest* frame, *conflict* frame, *morality* frame, or *economic consequences* frame. As visualized in Figure 1 and noted in the previous section (Magnitude of Frame Presence), discussions of climate change in conjunction with particular entities, institutions or individuals (be they public or private),

do not increase between 1997 and 2014, rather, magnitude of frame presence tends to decrease during this time. Figure 3 visualizes isolated mean magnitude levels for the attribution of responsibility frame and reveals a general decline, particularly between 2002 and 2012, where the average number of *yes* answers decrease from approximately 1.4 (2001, 2002) to 0.7 (2012). Further, Figure 3 reveals a consistent decline from 1997 to 2014, where the highest mean magnitude scores yielded continually decrease beyond those in preceding years. Thus, article incorporation of the attribution of responsibility frame does not increase over time.

Figure 3

Magnitude of Frame Presence, Attribution of Responsibility Frame



Note. Values represent the mean number of *yes* answers within the *attribution of responsibility* frame, for each year.

The magnitude of presence for the attribution of responsibility frame does not exceed levels yielded by the conflict and economic consequences frames, although it does exceed levels yielded by the human interest and morality frames. Table 8 details the mean magnitude levels of frame presence between 1997 and 2014, where higher scores are indicative of increased presence (and thus greater magnitude). According to Table 8, climate change was most often discussed in terms of conflict (1.55); followed by economic consequences (1.12); the attribution of responsibility to various entities (0.91); human interest dimensions (0.89); and morality (0.23).[7] Thus, the *attribution of responsibility* frame does not appear with greater magnitude than the *human interest* frame, *conflict* frame, *morality* frame, or *economic consequences* frame. As such, the results indicate no support for hypothesis two.

Table 8

Mean Magnitude Levels of Frame Presence

	Att. of Res.	Human Int.	Conflict	Morality	Economics
Mean (N = 1,111)	0.91	0.89	1.55	0.23	1.12

Note. Mean scores represent the average magnitude levels of frame presence between 1997 and 2014. Higher scores are indicative of increased presence.

[7] Refer to Table 5 for the statistical significance between mean magnitude levels of frame presence.

Table 9

Pearson Product-Moment Correlations of Computed Frame Variables

Frame (N = 1,111)	*1*	*2*	*3*	*4*	*5*	*M*	*SD*
1. Attribution of Responsibility	—					.91	1.11
2. Human Interest	.084**	—				.89	1.11
3. Conflict	–.034	–.023	—			1.55	1.26
4. Morality	.088**	.179***	.093**	—		.23	.52
5. Economics	.236***	–.081**	.218**	.033	—	1.12	1.16

Note. Correlations represent the longitudinal relationships between computed frame variables from 1997 and 2014. As noted in the previous section (Magnitude of Frame Presence), higher mean scores for each variable are indicative of increased *yes* answers in the coding scheme, and thus increased magnitude over time.
*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

Hypothesis Three

The results from this study indicate support for hypothesis three. Recall hypothesis three: As presence of the *attribution of responsibility* frame increases, presence of the *economic consequences* frame will also increase, and with greater magnitude than the *human interest* frame, *conflict* frame or *morality* frame. Table 9 details Pearson product-moment correlations between the computed frame variables and provides indications of relationships, significance and mean magnitude levels. As posited in hypothesis three, presence of the attribution of responsibility and economic consequences frames are positively related and statistically significant ($r = .236$, $p = .000$). Further, this

relationship appears with greater magnitude than the attribution of responsibility and human interest frames ($r = .084$, $p = .005$); the attribution of responsibility and conflict frames ($r = –.034$, $p = .259$); and the attribution of responsibility and morality frames ($r = .088$, $p = .003$). Although the hypothesized relationship is small, it is significant, and indeed appears with greater magnitude than the aforementioned relationships. Thus, the results indicate support for hypothesis three.

Hypothesis Four

The results provide support for hypothesis four. Recall hypothesis four: As presence of the *human interest* frame increases, presence of the *morality* frame will also increase, and with greater magnitude than the *economic consequences* frame, *attribution of responsibility* frame, or *conflict* frame. The Pearson product-moment correlations detailed in Table 9 reveal a positive relationship between the human interest and morality frames that is statistically significant ($r = .179$, $p = .000$). Further, this relationship appears with greater magnitude than the human interest and economic consequences frames ($r = –.081$, $p = .007$); the human interest and attribution of responsibility frames ($r = .084$, $p = .005$); and the human interest and conflict frames ($r = –.023$, $p = .453$). Indeed, the hypothesized relationship is considerably small, although statistically significant and greater than the aforementioned relationships. Thus, hypothesis four is supported.

Hypothesis Five

The results from this study indicate support for hypothesis five. Recall hypothesis five: As presence of the *conflict* frame increases, presence of the *economic consequences*

frame will also increase, and with greater magnitude than the *attribution of responsibility* frame, *human interest* frame, or *morality* frame. The Pearson product-moment correlations detailed in Table 9 reveal a positive relationship between the conflict and economic consequences frames that is statistically significant ($r = .218$, $p = .000$). Further, this relationship appears with greater magnitude than the conflict and attribution of responsibility frames ($r = –.034$, $p = .259$); the conflict and human interest frames ($r = –.023$, $p = .453$); and the conflict and morality frames ($r = .093$, $p = .002$). As noted previously, the hypothesized relationship is indeed small, but statistically significant and greater than the aforementioned relationships. Thus, hypothesis five is supported.

Extended Analyses

Additional analyses were conducted to reveal patterns of article allocation (i.e., whether external wire services were engaged) and authorship between 1997 and 2014. Such data were collected directly from the NewsBank database during the coding process, and as such, may reflect an approximate range from which implications may be rendered. Table 10 details the frequency in which particular sources (including the *Las Vegas Review-Journal*) were engaged, and reveals the explicit tendency for climate change to remain a topic discussed within originally produced content. Indeed, the majority of climatological articles (88.8%) were originally produced, while an additional 36 articles (3.2%) were produced by the external wire service, Stephens Washington Bureau; a company that now owns the *Las Vegas Review-Journal* ("We are Stephens Media," 2014). Counting Stephens Washington Bureau as an editorial extension of the *Las Vegas Review-Journal* would increase originally produced content from 987 articles

(88.8%), to 1,023 articles (92.0%). Although a variety of additional external wire services were incorporated between 1997 and 2014, the *Las Vegas Review-Journal* has retained the majority of editorial control with regard to discussions of climate change.

Table 10

Article Source

Source	Number of Articles	Percent
Las Vegas Review-Journal	987	88.8%
Stephens Washington Bureau*	36	3.2%
The Washington Post	23	2.1%
Reuter's	14	1.3%
Creator's Syndicate*	10	0.9%
Las Vegas Review-Journal and the Associated Press*	9	0.8%
Bloomberg	6	0.5%
Associated Press*	5	0.5%
Donrey Washington Bureau*	3	0.3%
Stephens Washington Bureau* and the Associated Press*	3	0.3%
Gaming Wire*	1	0.1%
King Features Syndicate*	1	0.1%
Las Vegas Business Press	1	0.1%
San Francisco Chronicle	1	0.1%
Tribune Content Agency*	1	0.1%
Tribune Media Services*	1	0.1%
Total	1,111	100.0%

Note. Asterisks (*) indicate news service providers that are not autonomous newspaper publications. Italicized source names indicate newspaper publications.

In order to examine the general tendencies of authorship between 1997 and 2014, author names were collected from the NewsBank database during the coding process. Table 11 reveals the general patterns of authorship between 1997 and 2014, and provides article specifications to identify particular publishing tendencies among the most frequently occurring authors. Given the diversity of authorship during the period under investigation, only authors who contributed at least 12 articles (1.1%) were detailed. Thus, authors who contributed fewer than 11 (1.0%) articles to the sample were amalgamated into the category, *all remaining authors*, that comprises of 344 articles (31.0%). Thus, Table 11 details the authorship of 767 articles (69.0%). Further, the category, *multiple authors; letters to the editor*, comprises of various individuals (usually service subscribers) who produced individual letters discussing climate change that were combined with other letters (also discussing climate change) into a single article, comprising of multiple letters to the editor. Although such articles were coded accordingly (as single articles), the various authors involved were amalgamated into the appropriate category, *multiple authors; letters to the editor*.

Table 11 reveals particular characteristics of authorship among varying article types between 1997 and 2014. Given the various individuals involved, no authors were detailed for 384 (34.5%) articles, of which 197 (17.7%) were letters to the editor that incorporated multiple authors (often newspaper subscribers). Articles that contained no authorship information consisted mostly of climatological editorials (122 articles, 10.9%), followed by news articles (55 articles, 5.0%), and *other* (i.e., content outside the categories listed in Table 11) (10 articles, 0.9%). Nonetheless, the content for which the 12 most prolific authors are listed comprises of 383 articles (34.5%), where the most frequently occurring

individual contributed 69 (6.2%) articles to the sample (John Edwards; 1 letter to the editor; 68 news articles). Most notably, the 12 most prolific authors detailed in Table 11 produced 91 editorials (8.2%) and 281 news articles (25%). Over half (54.4%) of all climatological news content between 1997 and 2014 was produced by 10 authors: Edwards (68 articles), Brean (46 articles), Suprynowicz (1 article), Rogers (42 articles) Tetreault (39 articles), Ball (36 articles), Robison (30 articles), Neff (3 articles), Vogel (14 articles) and Cling (2 articles), while 28.6% of all editorial content was produced by only four authors: Suprynowicz (43 editorials), Frederick (20 editorials), Neff (15 editorials) and Schumacher (13 editorials). Thus, discussions of climate change in the *Las Vegas Review-Journal* have remained under the direction of distinct, recurring (editorial and reportorial) authors with regard to climate change editorials (i.e., Suprynowicz, Frederick and Neff) and news content (i.e., Edwards, Brean, Suprynowicz, Rogers, Tetreault, Ball, Robison, Neff, Vogel, and Cling).

Table 11

Authorship and Article Type

Author	Letter(s) to the Editor	Editorial	News Article	Other	Total	Percent
Multiple authors; letters to the editor	197	0	0	0	197	17.7%
Not Provided	0	122	55	10	187	16.8%
John Edwards	1	0	68	0	69	6.2%
Henry Brean	0	0	46	0	46	4.1%
Vin Suprynowicz	0	43	1	0	44	4.0%
Keith Rogers	0	0	42	0	42	3.8%
Steve Tetreault	0	0	39	0	39	3.5%
Molly Ball	0	0	36	0	36	3.2%
Jennifer Robison	0	0	30	0	30	2.7%
Sherman Frederick	0	20	0	0	20	1.8%
Erin Neff	0	15	3	0	18	1.6%
Ed Vogel	0	0	14	0	14	1.3%
Geoff Schumacher	0	13	0	0	13	1.2%
Carol Cling	0	0	2	10	12	1.1%
All Remaining Authors	27	105	180	32	344	31.0%
Total	225	318	516	52	1,111	100.0%

Note. The amalgamated category, *all remaining authors*, consists of all authors who contributed fewer than 11 articles (1.0%) to the sample between 1997 and 2014.

CHAPTER FIVE

DISCUSSION

General Discussion

This investigation sought to provide an exhaustive assessment of textual climate change portrayals published in the *Las Vegas Review-Journal* between 1997 and 2014 by use of a deductive coding scheme and methods for uncovering: 1) longitudinal fluctuations of article publication frequency; 2) frame magnitude; 3) discussions of geographic scope; 4) patterns of (physical) article placement; 5) incorporations of external wire services; and 6) authorship across various article type categories. The five hypotheses posited in the previous chapter further assessed the relationship between particular frames in which the subject of climate change was situated. This chapter reviews the findings detailed in Chapter Four with regard to the general trends of climatological portrayals in the *Las Vegas Review-Journal*, and the implications of such findings on existing notions of climate change in the media, framing theory, the construction of environmentalism and anthropogenic climate change, and contextual stimuli design for audience effects investigations.

Portrayals of Climate Change in the *Las Vegas Review-Journal*

From the five hypotheses posited in Chapter Four, this investigation uncovered no support for incremental increases in climate change articles (hypothesis one), nor increasing incorporation of the attribution of responsibility frame over time (and thus higher magnitude levels) (hypothesis two). Article publication frequency fluctuated

between 1997 and 2014, and at times, declined markedly from levels yielded in preceding years (e.g., 2009, 143 articles; to 2010, 85 articles). Publication frequency even declined incrementally from 1997 (7 articles) to 2001 (3 articles), but increased between 2002 (12 articles) and 2006 (59 articles), and reached its highest level in 2007 (195 articles). Between 2008 and 2014, article publication frequencies remained at levels equal to, or higher than, 62 articles per year, and thus considerably higher than annual levels preceding 2007. Although frequencies of annual publications fluctuated, and at times declined, averages increased between 1997 and 2014. Such findings contribute to notions of generally increasing salience of climatological articles across myriad publications within various geographic regions (e.g., Liu et al., 2008; McComas & Shanahan, 1999; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013). Nonetheless, fluctuations in article frequencies did not support the estimated incremental increases posited in hypothesis one.

Presence of the attribution of responsibility frame did not increase between 1997 and 2014, nor did mean magnitude scores exceed those of the conflict and economic consequences frames. In their analysis of Dutch and French publications, Dirikx and Gelders (2010) noted mean magnitude levels of the attribution of responsibility frame in excess of the human interest, conflict and morality frames, and almost equal to levels of the economic consequences frame. Similarly, discussions of climate change in terms of economic consequences remained salient in the *Las Vegas Review-Journal*, but the attribution of responsibility to various individuals and institutions was not as prominent, and even declined from its highest magnitude level in 1997 (Figure 3). This finding diverges from Dirikx and Gelders's (2010) analysis of Dutch and French publications,

and further suggests divergence from studies that incorporate constructs similar to the attribution of responsibility frame (e.g., Shehata & Hopmann, 2012).

Although Dirikx and Gelders (2010) found support for their hypothesis positing high magnitude scores for the attribution of responsibility frame, the findings in this study suggest frame presence levels vary according to the publication under investigation, and additional confounding variables, such as the time periods under examination. For example, Dirikx and Gelders's (2010) sample consisted only of publications referring specifically to the annual United Nations Conferences of the Parties, which may have altered the observed magnitude of frame presence levels beyond what is generalizable to a broader sample that includes various types of articles (beyond only news) across longer periods of time. On the other hand, this investigation examined a considerably longer period of time (17 years compared to 7 years), included all types of articles that contained three keywords popular among content analysts (*climate change*, *global warming*, *greenhouse gas*), and focused only on one publication circulated primarily within a regional geographic area in the United States (Las Vegas, NV). Thus, declining presence of the attribution of responsibility frame may be a communication phenomenon unique to the *Las Vegas Review-Journal*, but nonetheless a finding that should be further investigated by use of the coding scheme employed in this study.

By combining frame questions to render computed frame variables, this analysis detailed magnitude levels of frame presence, the statistical significance between frames over time, and hypothesized distinct, significant correlations between particular constructs. Between 1997 and 2014, the magnitude levels of frame presence never exceeded 2.2 (Figure 1), which is relatively low given the potential for frames with four

or five questions to theoretically yield scores as high as four or five (i.e., the attribution of responsibility, human interest and conflict frames). Nonetheless, an exploratory one-way ANOVA between the five frames uncovered average differences that are statistically significant over time, with exception to the morality frame ($F = 1.27$, $p = .203$) (Table 5). Although magnitude of presence levels are moderate across all constructs, the statistical significance yielded in the exploratory one-way ANOVA suggests significant longitudinal differences exist between attributions of responsibility ($F = 2.666$, $p = .00$), human interest stories ($F = 7.644$, $p = .00$), discussions of conflict ($F = 1.981$, $p = .01$) and considerations of economic consequences ($F = 2.216$, $p = .003$). These findings oppose those of Dirikx and Gelders's (2010) analysis, where comparisons of average frame magnitude levels (by use of ANOVA) across four publications over time, yielded statistically insignificant results for the attribution of responsibility, economic consequences and human interest frames. Divergent findings between this investigation and Dirikx and Gelders's (2010) analysis of Dutch and French publications may suggest that statistically significant differences between mean magnitudes of presence levels are a unique aspect of climatological portrayals in the *Las Vegas Review-Journal*, although additional investigations are necessary to support this notion.

As noted in Chapter Four, hypotheses three through five asserted positive, significant relationships between: 1) the attribution of responsibility and economic consequences frames (hypothesis three); 2) the human interest and morality frames (hypothesis four); and 3) the conflict and economic consequences frames (hypothesis five). Further, such relationships were posited to appear with greater magnitude than any other possible frame combinations in the correlation matrix (Table 9). Although hypotheses three through five

were supported with levels of significance no greater than .01, Pearson product-moment correlations approached moderate (at best), and yielded no correlations greater than .236 (economic consequences and attribution of responsibility frames, $p \leq .001$) (Table 9). Although exploratory—and thus in need of additional investigation to increase validity across additional publications—hypotheses three through five confirm a low-level proclivity for discussions of economic consequences to appear concurrently with responsibility claims ($r = .236$, $p = .000$) or portrayals of conflict ($r = .218$, $p = .000$) and human interest stories to appear with suggestions for moral behavior or references to religious tenets ($r = .179$, $p = .000$) (Table 9).

Assessment of article scope uncovered the frequency at which particular geographic areas were discussed (or not) in terms state and national boundaries in the *Las Vegas Review-Journal*, which included areas considered *regional*, and/or *national*, and/or *international*.[8] Articles that did not refer to any particular geographic area(s) were coded accordingly (i.e., *no geographic area[s] mentioned*). In this study, there emerged frequent discussions of climate change that referred to areas within the United States at large, and in particular, Southern Nevada specifically. With regard to the prevalence of autonomous geographic scopes, articles referring to Southern Nevada specifically occurred most frequently (33.6%), compared to discussions of national (21.8%) and international (2.7%) areas (Table 6). With regard to the prevalence of articles that amalgamated geographic scopes, discussions that included areas within the United States (i.e., regional and national) occurred most frequently (90.1%), while discussions that

[8] As noted on page 60, *regional* refers to Southern Nevada specifically; *national* refers to any area(s) outside Southern Nevada and within the 48 contiguous states, Alaska and Hawaii; and *international* refers to any area(s) outside of the 48 contiguous states, Alaska and Hawaii.

included international areas occurred less frequently (17.8%). Nonetheless, articles that discussed Southern Nevada—either autonomously or in conjunction with other geographic areas—were most prevalent (60.9%), followed by discussions of national (54.7%) and international (17.8%) areas. Thus, discussions of climate change in the *Las Vegas Review-Journal* most frequently referred to Southern Nevada, whether or not additional geographic areas were mentioned.

The findings pertaining to article scope oppose those of Ahchong and Dodds (2012) and Liu et al. (2008) where discussions of geographic areas were assessed in regionally and nationally distributed publications (from Canada and the United States). In particular, Ahchong and Dodds (2012) noted climate change coverage in the *Toronto Star* (a regionally distributed publication in Canada) and the *Globe and Mail* (a nationally distributed publication in Canada) referred primarily to Canada at large, or international areas outside of Canada. Similarly, Liu et al. (2008) noted climate change coverage in the regionally distributed *Houston Chronicle* referred primarily to the United States at large, or international areas outside of the United States. Ahchong and Dodds (2012) and Liu et al. (2008) found the prevalence of national and international scope coverage a problematic facet of climate change discussions, such that contexts were generalized and not directly related to specific areas within which audiences were situated. Although discussions of the United States at large occurred frequently in this investigation, incorporations of the regional scope were indeed most prevalent, and thus divergent from the previous studies noted above. Additional studies across various publications are necessary to determine whether regional geographic scope centrism is an anomalous

phenomenon unique to the *Las Vegas Review-Journal*, and one that impacts audiences according to the suppositions of Ahchong and Dodds (2012) and Liu et al. (2008).

Article placement patterns in the physical *Las Vegas Review-Journal* were detailed to assess an approximation of visibility and topic salience between 1997 and 2014. As noted in Chapter Four, most articles (80.9%) remained situated on pages succeeding the first (A1), or within the second section (B) between pages B1 and B12 (50.9%). Further, only 46 articles (4.4%) between 1997 and 2014 were situated on the front page of the first section (A1), although 253 articles (24.0%) were situated on the first page of any section (including A). If article placement indicates salience and visibility for readers, then climate change has remained a topic of approximately moderate importance and visibility between 1997 and 2014. As this component is exploratory among content analyses of climate change, additional studies are necessary to assess an accurate approximation of article placement and subsequent effects on perceived salience and/or visibility among audiences. Nonetheless, most portrayals of climate change in the physical *Las Vegas Review-Journal* remained situated on pages, and within sections, succeeding the first (Table 7). Given the necessity for editors to deliberately situate articles, the placement tendencies uncovered in this investigation could indicate adherence to an underlying ideological or political orientation in the *Las Vegas Review-Journal* that supports or opposes notions of anthropogenic climate change. Content analysts have argued the presence of particular ideological or political adherence by analyzing article content of climate change portrayals in various nationally distributed publications (e.g., Antilla, 2005; Boykoff & Boykoff, 2004), although considerations of article placement to support such claims remains emergent and worth additional consideration.

Extended analyses were conducted to assess the production of article content in terms of wire content incorporation and authorship patterns across various types of articles. As detailed in Chapter Four, 987 articles (88.8%) in the sample were originally produced without incorporating any external wire service content, and an additional 36 articles (3.2%) incorporated content from Stephens Washington Bureau (i.e., Stephens Media), the parent company of the *Las Vegas Review-Journal* ("We are Stephens Media," 2014). Whether or not external wire service content was incorporated, journalists from the *Las Vegas Review-Journal* contributed to 996 climate change articles (89.6%) between 1997 and 2014, and entities financially affiliated with the *Las Vegas Review-Journal* (i.e., Stephens Washington Bureau, Donrey Washington Bureau, Gaming Wire) contributed to 43 articles (3.9%) ("Gaming Wire," 2015; "Washington News Bureau," 2001). Further, 10 journalists authored 54.4% of all climate change news articles, while four journalists authored 28.6% of all editorial content, and potentially an additional 16.8% of editorial content that did not contain byline information (Table 11). Given the prevalence of climate change articles produced autonomously by the *Las Vegas Review-Journal* among consistently recurring authors, the findings suggest the *Las Vegas Review-Journal* has retained editorial control over discussions of climate change, particularly within news content. Given the lack of existing research that longitudinally examines editorial control over portrayals of climate change, generalizability to other publications is questionable. Nonetheless, the findings suggest portrayals of climate change in the *Las Vegas Review-Journal* have remained under particular constraints, where incorporations of external wire content is scant, and (news) content production occurs primarily among a specific group of authors.

Implications of the Results

Overall, the findings in this study suggest the *Las Vegas Review-Journal* constructs a particular reality of climate change that, at times, diverges from coverage assessed in previous analyses. Oscillations in annual publication frequencies did not support hypothesis one, although general increases between 1997 and 2014 supports notions of emerging salience, as posited by previous scholars (e.g., Liu et al., 2008; McComas & Shanahan, 1999; Shehata & Hopmann, 2012; Takahashi & Meisner, 2013). Declines of the attribution of responsibility frame oppose findings in Dirikx and Gelders's (2010) analysis that uncovered increases in the attribution of responsibility frame within Dutch and French publications between 2001 and 2007. Further, this study uncovered longitudinal statistical significance between all frame constructs (with exception to the morality frame) by use of ANOVA (Table 5), which opposes the statistical insignificance detailed in Dirikx and Gelders's (2010) analysis. In this study, the conflict and economic consequences frames appeared with greatest magnitude between 1997 and 2014, compared to Dirikx and Gelders's (2010) findings that noted high presence magnitudes for the attribution of responsibility and economic consequences frames. With regard to article scope, this study uncovered the tendency for climate change portrayals to most frequently refer to Southern Nevada specifically, whether or not in conjunction with references other geographic areas. Indeed, this finding opposes those of Ahchong and Dodds (2012) and Liu et al. (2008) who noted tendencies for climate change portrayals to reference primarily large general areas within national boarders (i.e., the national scope) or areas beyond national boarders (i.e., the international scope).

With regard to exploratory components of this analysis, statistically significant Pearson product-moment correlations uncovered positive relationships between attributions of responsibility and discussions of economic consequences ($r = .236$, $p = .000$), portrayals of conflict and discussions of economic consequences ($r = .218$, $p = .000$), and human interest narratives and discussions of moral behavior and/or religious tenets ($r = .179$, $p = .000$). With regard to article placement, tendencies in the physical *Las Vegas Review-Journal* suggest an approximately moderate level of visibility between 1997 and 2014. Most portrayals of climate change remained situated on pages succeeding the first (A1) and within the second section between pages B1 and B12, and only few portrayals of climate change (4.4%) between 1997 and 2014 were situated on the first page of the first section. Further, tendencies for the *Las Vegas Review-Journal* to incorporate mostly original content—or content from financially affiliated companies, such as Stephens Washington Bureau—suggests portrayals of climate change remain under editorial control of the *Las Vegas Review-Journal* and a specific group of recurring authors.

Finally, as climate change remained an increasingly salient topic with regard to article publication frequencies, details regarding physical article placement—in addition to consideration of editorial control—suggest a diminished level of importance, and perhaps visibility (in the physical newspaper). Consideration of frames with the highest average magnitude of presence levels provides further context: Climate change was most often framed in terms of conflict and economic consequences. Thus, articles often included portrayals of disagreement, disapproval, two-sided arguments, and/or discussions of winners and losers (i.e., the conflict frame), or discussions of financial gains or losses,

involved expense(s), and/or references to economic consequences (i.e., economic consequences frame). Based on previous literature (e.g., Boykoff & Boykoff, 2004; Dirikx & Gelders, 2010; McComas & Shanahan, 1999; Zamith et al., 2012), presence of the conflict and economic consequences frames may serve to support particular interests (e.g., business or otherwise) by introducing arguments that question the legitimacy of climate change science. Although this study did not examine whether portrayals were supportive or unsupportive of climate change in this sense, prevalence of the conflict and economic consequences frames may be consistent with findings in previous literature. That is, portrayals may have situated climate change in frames that are critical and/or question notions of anthropogenic causations.

Framing Theory

The frames in which climate change was discussed in the *Las Vegas Review-Journal* were identified using a deductive coding scheme according to Entman's (1993) description of framing theory. According to Entman (1993), frames situate subjects in particular terms that may offer solutions, posit arguments, identify issues, and offer a general schema within which the subject may be reduced, and thus effectively communicated. In other words, frames allow media organizations, and others, to portray otherwise complicated topics—such as climate change—in simple terms by associating it with already familiar concepts. With regard to this study, the deductive coding scheme used to uncover particular frames provided a general sense of the portrayals in which climate change was situated. Although the particular frames developed in the coding scheme yielded different magnitudes of presence that were statistically significant, the

scheme required the reduction of information into quantifiable terms at the nominal level, where coders answered *yes* or *no* to each frame question to determine the overall presence within computed frame variables that combined, and averaged, the average *yes* or *no* answers for each frame, within each year. The results of this study reinforce the theory of framing in the canon of communication, particularly for notions of deductive, quantitative analyses, so long as the coding instrument allows for reproducibility (reliability), and yields results that are generalizable to broader bodies of work (validity). If these criteria are met, then effective framing analyses may be conducted that contribute to existing notions of climate change portrayals in the media (or portrayals of other issues).

The Construction of Environmentalism and Anthropogenic Climate Change

Although this study did not consider the full history of environmentalism and the social construction of anthropogenic climate change, it did uncover particular frames that raise questions about contemporary discussions of natural environments in a regional publication, and elsewhere. As noted in Chapter One, the emergence of contemporary *environmentalism* involved a variety of components pertaining to rationality, (primarily) Judeo-Christian theology and urbanization, spanning from the Enlightenment to the Industrial Revolution, to ongoing developments in (post)industrial societies (Cronon, 1996; del Mar, 2006). In particular were the shifts in thinking during the mid-nineteenth and early twentieth centuries, when the first national parks were designated, and officially separated from increasingly urbanized areas. National parks became places of (re)creation and distinct from the cores of development: they were constructions of an

idealized natural landscape that remained pristine, sublime, and feminine. As national parks were created, so too were areas from which natural resources were extrapolated to sustain rapid developments in infrastructure. In the process, ecological beauty was systematically determined, preserved, and controlled.

In a contemporary context, concerns about environmental exploitation have emerged in the form of *anthropogenic climate change*, where human activities result in harmful emissions that cause inappropriate changes to natural biological systems (Bell, 2012). Scholars in the physical sciences have indeed engaged myriad studies to assess the impacts of human activities on the physical environment (e.g., IPCC, 2007, 2014), but others have engaged philosophical investigations to deduce societal ideas of the environment, as purveyed in the media, and by other means. As noted in Chapter One, most scholars consider the environment and anthropogenic climate change a social construction of reality, whereby changes to natural systems are no less changes to the *ideas* of such systems, whether or not precipitated by the emissions of human activities (e.g., Cronon, 1996; Dake, 1992; Greider & Garkovich, 1994; Hansen, 1991; Lamb, 1996). Thus, assessments of climate change in the media are no less examinations of a social construct that remains historically grounded (approximately) in the Enlightenment and Industrial Revolution, yet amenable to contemporary events and subsequent shifts in thinking.

The results in this study may indicate one particular shift in conceptions of environmentalism and anthropogenic climate change. The most prevalent frames of conflict and economic consequences, compared to the less prevalent frames of attribution of responsibility, human interest stories, and morality indicate the *Las Vegas Review-*

Journal constructs a reality in which environmentalism and anthropogenic climate change are relatively controversial and potentially detrimental to capitalistic enterprises. In particular, diminished emphasis on the attribution of responsibility and human interest frames, minimize notions that inappropriate ecological changes caused by the emissions of human activities should be the responsibility of any particular individual or institution, or that impacts on specific individuals—such as climate change refugees—need not more consideration than possible impacts on markets or conflicting arguments that refute climate change writ large. Further, the tendency for most articles to focus on Southern Nevada specifically with regard to climate change framed in terms of conflict and economic consequences, provides clear distinctions of the potential issues and impacts if strategies that mitigate human emissions are engaged for something otherwise entirely esoteric and undetected by the usual publication subscriber. In this sense, environmentalism and anthropogenic climate change—as constructed by the *Las Vegas Review-Journal*—represent concepts of political and economic controversy, as opposed to concepts of empirical scientific observation. Thus, constructions of environmentalism and anthropogenic climate change in the *Las Vegas Review-Journal*, compared to historical developments, have undergone conceptual reductions from representing ecology, to conflicts of policy and economics. Given the lack of generalizability to the broader contemporary construction of nature and climate change among various media outlets, additional analyses are necessary to assess the degree to which media portray the environment within frames that emphasize political and economic issues.

Contextualized Stimuli Design

Audience effects investigations are necessary to determine the extent to which particular frames might influence individual notions of climate change. Although experimentalists have investigated the impacts of climate change portrayals with relative frequency, current analyses have tended to overgeneralize stimuli design, or reduce the nuance uncovered by content analysts to simplified concepts (e.g., Corbett & Durfee, 2011; Morton et al., 2011). Such studies have indeed contributed to the existing knowledge base surrounding the impacts of climate change portrayals, but with limitations. For example, Corbett and Durfee (2004) investigated the extent to which supportive and unsupportive frames impacted respondent certainty of climate change. Similarly, Morton et al. (2011) assessed the effects of stimuli that discussed the existence of climate change in positive or negative terms. Although both studies discussed the findings of prior content analyses and varying portrayals within publications, stimuli were reduced, otherwise arbitrarily, to frames that were *unsupportive* or *supportive*; *negative* or *positive*.

Although myriad content analyses of climate change portrayals have sufficiently reported the tendencies of relative characteristics among various publications, experimental stimuli have remained simplified, and thus somewhat removed from reality. As noted in this study, climate change portrayals may be situated in terms that are not entirely negative or positive, nor supportive or unsupportive, and considering discussions of conflict or economic consequences as either may be premature, but certainly reductionist. Given the frequent points at which the findings in this study diverge from previous analyses of national and international publications, it should be clear that

portrayals of climate change may vary based on the location in which a publication is situated. Extraneous conditions, such as geopolitical, infrastructural or water distribution issues (as in the case of Las Vegas, NV) should be considered to develop contextualized stimuli that examine portrayal effects on audience members situated within the region of the publication. Given these conditions, individuals in such areas may experience environmental issues (and media portrayals of them) disproportionately, particularly considering the audiences to which media portrayals mostly appeal, and the disadvantaged classes that tend to receive considerably less information (see Downs, 1972; Kollmuss & Agyeman, 2002; McComas & Shanahan, 1999, for further discussions on the knowledge gap hypothesis). At most, such contextualized stimuli may provide further insight into the effects of frame constructs on audience attitudes, and at least, it will incorporate the nuance uncovered within content analyses into experimental investigations.

Interpretation of the Results

The results in this study may not indicate any particular trends that are generalizable to national or international publications. Rather, it details the particular reality constructed by a publication situated in an environmentally precarious area. Despite extreme, prolonged drought conditions, declines in the Lake Mead reservoir, and infrastructural issues pertaining to water distribution (Brean, 2013; Futrell, 2001; Holthaus, 2014; Shine, 2014), the *Las Vegas Review-Journal* has situated portrayals of climate change in terms of conflict and economic consequences, that focus primarily on Southern Nevada, and remain situated in less prominent sections of the physical

newspaper. Consideration of editorial control provides further context for the frames in which climate change was most often (deliberately) discussed: More than 90% of content was produced by the *Las Vegas Review-Journal* or financially affiliated organizations. Given the circumstances discussed in this chapter, climate change as constructed by the *Las Vegas Review-Journal* may be shifting from its historical association with nature, to issues of conflict and economic consequences. A prevalent association of climate change with such frames may indeed erode the historical foundation on which the constructs remain based, thereby advancing a redefinition of climate change or environmental issues at large. Although additional analyses are necessary to determine the extent to which an underlying political or ideological orientation may be influencing portrayals of climate change, the current findings suggest that such an adherence may exist.

Strengths of the Current Study

There were several strengths of this study pertaining to historical background, theory, methods, coding and coder training. Specifically, this study provided an historical background of environmentalism and anthropogenic climate change as known in contemporary society in order to advance a general orientation for interpreting the results and implications. Although somewhat brief, the historical background further expanded the scope of this study to consider the context of climate change portrayals in the *Las Vegas Review-Journal* within the broader contemporary construction of environment and climate change.

This analysis explicitly incorporated framing theory to orient data collection, interpret results, and provide implications in the context of constructs and framing theory itself.

This explicit theoretical orientation further clarified notions of particular constructs, or schemas that would have otherwise remained nebulous to the reader, and provided no grounding from which results could be generalized.

The methods in this study incorporated a broad scope of articles that included news, editorials, letters to the editor, and additional types such as entertainment reviews (coded as *other*). Additional data pertaining to author names, page numbers and sources were also collected to extend the analysis beyond the mere presence or absence of frames over time. Finally, this study examined a considerably large number of articles (1,111) when compared to the existing content analyses of climate change, which thus provided a broader perspective of coverage in the *Las Vegas Review-Journal*.

The coding scheme used in this study was developed primarily by scholars examining data from qualitative interviews, and has been employed by various multidisciplinary analyses to examine portrayals of adoption, asylum seekers, European politics and climate change (d'Haenens & de Lange, 2001; De Vreese et al., 2010; Dirikx & Gelders, 2010; Kline et al., 2006; Semetko & Valkenburg, 2000). In this regard, historical uses of the coding scheme ensure reproducibility and contribute to the reliability and validity of data yielded.

Coder training entailed multiple (re)assessments of instructions, layout design and discussion of coding rationale. A pilot test of the coding materials provided further clarity for areas in need of refinement. As the majority of items examined in this study were latent, such refinements were necessary to conduct effective coder training. Based on the assessment of inter-coder reliability for the 20 frame questions, refinement procedures

successfully yielded levels at, or above .70 (with exception to the third question in the human interest frame) (Table 3).

Limitations

Limitations with this study included representativeness of the sample size, the use of binary *yes*/*no* answers in the coding scheme, missing section information of specific page numbers, questionable translations of physical article placement to placements in the online environment, missing information regarding article length in relation to the presence of frames, relatively similar hypotheses with regard to examining the magnitude of frame presence, and analysis of articles only from the *Las Vegas Review-Journal*. Although this study examined a relatively large number of articles over 17 years, the findings did not indicate portrayal patterns since the *Las Vegas Review-Journal* began circulation in 1949. Inclusion of such articles would have provided additional breadth to support overarching generalizations about constructions of the environment and climate change since establishment of the publication.

Although the coding scheme in this study has been engaged by a variety of scholars to examine various portrayals of issues across disciplines, answer options to each frame question required coders to select either *yes* or *no*. Dirikx and Gelders (2010) incorporated Likert-type answer options (ranging from "don't agree" to "completely agree") to examine the degree to which coders felt a particular item was present or absent. Nonetheless, Dirikx and Gelders (2010) argued this method was reliable by measuring internal consistency by use of Cronbach's alpha, as opposed to inter-coder reliability by using, for example, Krippendorff's alpha. Statisticians have long noted the

inappropriateness of using Cronbach's alpha to infer inter-coder reliability (e.g., Hughes & Garrett, 1990; Krippendorff, 2004; Lombard et al., 2002), which raises validity questions about Dirikx and Gelders's (2010) claims of reliability by using internal consistency measures for such an answering method. Binary answers, however, were reductionist in this study and required coders to dismiss observations of nuance if an item was interpreted as neither completely absent nor present.

This study examined patterns of article placement in the physical *Las Vegas Review-Journal* by collecting specific page number data. Although this data indicated general placement tendencies, additional information pertaining to sections (i.e., whether section B was the "Nevada" section or "Business" section) was missing. This information would have provided increased nuance to the placement tendencies of climate change articles, and thus contributed to the results and implications.

The collection and interpretation of physical page number data revealed a perspective of placement tendencies that remain limited for inferring placement tendencies within online environments. Given the increasing dissemination of print media via the Internet, including newspaper websites, the *Las Vegas Review-Journal* may have developed an online environment—and subsequent placement tendencies—that diverge notably from those in the physical newspaper, although additional analyses are necessary to support this notion. Nonetheless, whether or not the *Las Vegas Review-Journal* yields similar placement tendencies between its physical and virtual versions, generalizability of physical placement patterns revealed in this study are questionable.

Although this study examined longitudinal fluctuations of mean magnitude scores for particular frames between 1997 and 2014, additional controls—such as article word

count—were not available to examine the relationship between magnitudes of frame presence and article length over time. Such data would have provided increasingly detailed results from which distinct implications could have been derived.

The hypotheses of this study primarily examined the interrelationships of climate change frames using Pearson product-moment correlation coefficients of mean magnitude of frame presence scores. Although the various frames employed in this study have undergone development throughout a series of previous multidisciplinary analyses, they remain reductionist and conceptually similar. Subsequently, the hypotheses were related, examining primarily bivariate corollary relationships, from which small (at best) significant results were revealed. Although reliable, generalizability of such results should be interpreted with caution.

Finally, this study did not collect data from any additional publications disseminated in Southern Nevada, namely, the *Las Vegas Sun*, which operates independently of the *Las Vegas Review-Journal*. In 2005, an agreement between Greenspun Media Group (owner of the *Las Vegas Sun*) and the *Las Vegas Review-Journal* determined that physical copies of both newspapers would be distributed together to subscribers of the *Las Vegas Review-Journal* (Rainey, 2006). Thus, climate change portrayals likely retained similar levels of visibility from 2005 onward, given that both publications were distributed together. Aside from visibility, however, additional analyses of the *Las Vegas Sun* could have provided further context with regard the presence or absence of particular frames, placement tendencies and editorial control, from which implications could have been derived.

Recommendations for Future Research

As noted previously throughout this study, scholars should continue to examine the nuance of climate change portrayals within media, both in Southern Nevada and elsewhere, and its subsequent effects by developing contextual stimuli. With regard to content analyses, scholars who engage in collecting any latent data should be cautious about the design of the coding instrument and processes of training. Whether the coding instrument from this study, or others, is engaged, at least one pilot test should be conducted to assess the quality of instruction and feedback pertaining to the presence or absence of constructs. Further, the pilot test will allow the investigator to examine their own logic for determining the presence or absence of constructs, from which alterations may be made, and instruction to the coder(s) improved.

With regard to audience effects investigations, scholars should consider existing content analyses to develop increasingly nuanced stimuli beyond *positive* or *negative* portrayals that also include geographically relevant information. Based on the findings in this analysis, one might consider developing a stimulus that contains conflict, economic consequences, and references to severe drought in Southern Nevada, for administration to disadvantaged and advantaged respondents living in Southern Nevada. Further, another stimulus might replace conflict and economic consequences with human interest narratives and discussions of moral obligations. Doing so increases contextual relevance of stimuli for various respondents, which may yield additional details beyond the results of previous audience effects analyses.

Example 1

Study predicts more instability in Colorado River water flows

Las Vegas Review-Journal (NV) - Tuesday, April 26, 2011
Author: *Doug McMurdo*

A report released Monday confirms what officials at the Southern Nevada Water Authority have known for years: Climate change will have a detrimental effect on millions of water users in the West for decades to come.[1]

Southern Nevadans can expect decreases of 8 percent to 14 percent a year on the stretch of the Colorado River that they depend on for their water, according to the report.

The Department of the Interior's Bureau of Reclamation compiled the study to meet a requirement of the federal Secure Water Act. It combines data from previous reports that warn a warming planet poses significant risks to water users. The assessment looks at the risks for water operations, flood control and fish and wildlife in three river basins: the Colorado, Missouri and Rio Grande.

The Colorado supplies water for seven Western states, including Nevada, Arizona and California.

"(The study) looks at minimums and maximums," water authority spokesman J.C. Davis said. "As we get closer to 2050 and 2070, our maximum years, good water years, will be a little less good, and our bad years will be a little worse.

"What this tells us is that there is substantial uncertainty. What do we do to reduce our reliance on Colorado River water and how do we manage demand?"

Davis said that uncertainty over future allocations from the Colorado River is what motivated the water authority to apply for scores of groundwater rights in basins in rural Nevada. The authority continues to pursue the permitting process, which could take years.[2]

"That's our safety net," he said. "That's how we become hydrologically independent."

The authority also is constructing a third intake at Lake Mead that will allow water to keep being drawn even if the lake level drops considerably.[3]

The water authority has made substantial strides in conservation efforts. Since 2002, water use in Clark County has been reduced by 32 billion gallons even as the population grew by 400,000.[4]

A turf replacement program that has eliminated 150 million square feet of sod, restrictions on how much grass homeowners can plant and a ban on grass for new businesses, restrictions on outdoor watering, and an innovative push to desert landscaping played a huge role in the dramatic savings.[5]

Davis said the figures released in Monday's report are accurate insofar as large numbers can be accurate, but he also said climate change could render them moot.

"We're going to get wilder mood swings from Mother Nature," he said.

On the side of good news, Davis said the relative youth of Las Vegas means fewer leaks for the pipes and other infrastructure that handle the valley's water.[6]

The water authority also has aggressive, systematic replacement programs that should save the valley from dealing with an antiquated system in the coming decades, he said.[7]

Codes for Example Article 1

Attribution of Responsibility

Does the story suggest that some level of government has the ability to alleviate climate change?	Yes (1)	No (0)
Does the story suggest that some level of the government is responsible for climate change?	Yes (1)	No (0)
Does the story suggest solution(s) to climate change?	Yes (1)	No (0)
Does the story suggest that an individual (or group of people in society) is responsible for climate change?	Yes (1)	No (0)
Does the story suggest that the problem requires urgent action?	Yes (1)	No (0)

Human Interest Frame

Does the story provide a human example or "human face" of the effects of climate change?	Yes (1)	No (0)
Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)
Does the story emphasize how individuals and/or groups are affected by climate change?	Yes (1)	No (0)
Does the story go into the private or personal lives of people associated with climate change?	Yes (1)	No (0)
Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)

Conflict Frame

Does the story reflect disagreement between political parties, individuals, groups, and/or countries?	Yes (1)	No (0)
Does one party, individual, group and/or country reproach another?	Yes (1)	No (0)
Does the story refer to two sides or to more than two sides of the problem or issue?	Yes (1)	No (0)
Does the story refer to winners and losers?	Yes (1)	No (0)

Morality Frame

Does the story contain any moral message?	Yes (1)	No (0)
Does the story make reference to morality, God, and/or other religious tenets?	Yes (1)	No (0)
Does the story offer specific social prescriptions about how to behave?	Yes (1)	No (0)

Economic Frame

Is there a mention of financial losses or gains now or in the future?	Yes (1)	No (0)
Is there a mention of the costs/degree of expense involved?	Yes (1)	No (0)
Is there a reference to economic consequences of pursuing a course of action?	Yes (1)	No (0)

Example 2

Lifting the global warming gag order

Las Vegas Review-Journal (NV) - Sunday, February 25, 2007
Author: *Vin Suprynowicz*

A 2003 poll of 530 climatologists in 27 countries showed 34.7 percent of interviewees endorsed the notion that a substantial part of the current global warming trend — which might see temperatures rise by a degree or two, on average, by century's end — is caused by man's industrial activities (driving cars and the like).

More than a fifth — 20.5 percent — rejected this "anthropogenic hypothesis." The rest (two-thirds) were undecided.

The skeptics now include the 85 climate experts who signed the 1995 Leipzig Declaration; the 4,000 scientists from around the world (including 70 Nobel laureates) who signed the Heidelberg Appeal, and the 17,000 American scientists who signed the Oregon Petition. (Find these all through www.sepp.org or www.globalwarminghysteria.com.)[8]

Danish statistician Bjorn Lomborg bought the sky-is-falling scenario until he bothered to check some of the numbers, which led him to do his own research, at which point he wrote the book "The Skeptical Environmentalist" and became The Man The Greens Love to Hate. He reminded the folks at www.techcentralstation.com on Nov. 30 that most economists believe the projected level of warming would either have no effect or be beneficial.[9]

Cold weather kills people, Lomborg reminded us. "It is estimated that climate change by about 2050 will mean about 800,000 fewer deaths." And that's before we even get around to increased food production. (If you want a real climate catastrophe, let's talk about the next Ice Age, which is due relatively soon.)[10]

What's more, scientists at Ohio State University announced Feb. 12 that Antarctic "temperatures during the late 20th century did not climb as had been predicted by many global climate models." In fact, they went down (www.eurekalert.org/pub_releases/2007-02/osu-atd021207.php).

So why would one get the sense from the daily barrage of electronic news that "all experts now agree" the earth is heating catastrophically, and that mankind's use of fossil fuels is at fault?

First, pay attention to the wording. Many who want American taxpayers to provide welfare schooling and welfare health care for everyone who can walk here from Mexico and points south blithely lie and say their opponents "oppose immigration" — rather than acknowledging the debate is about "illegal immigration." Likewise, those who aim to cripple the industrial economies of the Western world are careful to ridicule those who "deny global warming," instead of acknowledging that most skeptics agree there is indeed some minor warming going on. Instead, those skeptics object to the notion that this is a crisis and that mankind's activities are primarily "at fault" — along with the corollary nutty prescription that destroying every power plant and automobile in America and Western Europe would make much difference.[11]

"Spreading the global warming gospel with unified voice are 12,000 environmental groups controlling about $20 billion in assets," the Tucson-based Doctors for Disaster Preparedness reported last month. In comparison, "Truth seekers have at most a few million, lack the support of the press or Hollywood, and are generally shut out of government-funded schools and universities."

Which is where the foulest and most inexcusable abuses occur, of course.

In direct contravention of the First Amendment guarantee that our tax dollars will never be spent to impose any "establishment of religion," our children are in fact being spoon-fed the Green doctrine of global warming — memory bytes in doggerel and song — when they're far too young to bring any critical faculties to bear on this hypothesis.[12]

And some critical perspective sure is needed.

Spiralling energy costs fueled by green hysteria "have caused the loss of

100,000 jobs in the UK over 18 months," report Doctors for Disaster Preparedness, again citing techcentralstation.com. Al Gore's anti-global warming plan would leave the average person 30 percent poorer by 2100, according to the Jan. 18 Wall Street Journal.[13]

In the book "Unstoppable Global Warming — Every 1,500 Years," authors S. Fred Singer and Dennis T. Avery point out that scrapping every car, truck and SUV in America would reduce greenhouse gas emissions by only about 2 percent. Meantime, merely extinguishing all the coal deposit fires that continue to burn unchecked around the world would reduce those emissions by 2 to 3 percent. Which is a more sensible thing to try?

Clearly, those who want to cripple our industrial economy have some other motive. And maybe that explains how shrill they can get in their attempt to silence the hated "climate deniers," who they now liken to "Holocaust deniers."[14]

According to U.S. Sen. Olympia Snowe's own Web site, she and Sen. Jay Rockefeller, D-West Virginia, sent a letter to ExxonMobil Chairman Rex Tillerson in October demanding the firm stop funding "a small cadre of scientists" who question global warming dogma, instead insisting the heavily regulated oil company "publicly acknowledge both the reality of climate change and the role of humans in causing or exacerbating it."[15]

ExxonMobil, whose executives presumably know where gasoline taxes and offshore oil leases come from, cut off its funding for the Competitive Enterprise Institute last year.

But when it comes to intimidating the opposition, the senators are pikers. The British foreign secretary "has said that skeptics should be treated like advocates of Islamic terror and denied access to the media," Doctors for Disaster Preparedness report in their January newsletter. George Monbiot wrote in England's "Guardian" that, "Every time someone drowns as a result of floods in Bangladesh, an airline executive should be dragged out of his office and drowned."[16]

Grist magazine has called for Nuremberg-style war crimes trials for those who deny the internal combustion engine is about to cause a global climate disaster. Heidi Cullen, host of the weekly global warming TV show "Climate Code," has called for the American Meteorological Society to strip its certification from any weatherman (or gal) who publicly questions anthropogenic global warming.

Meantime, European Union Environment Commissioner Stavros Dimas tells the BBC that people should view the battle against climate change as a war — accepting the privations of a wartime economy and expecting millions of casualties.[17]

And we were wondering why we only seem to hear one side of the story, these days? Isn't that kind of like asking why no one ever stood up in church in early 16th century Europe and started explaining how unlikely it was that these witches were really flying around at night, causing other people's cows to go dry?[18]

It is dangerous to be right, Voltaire warned us, when those in power are so very wrong.

Codes for Example Article 2

Attribution of Responsibility

Does the story suggest that some level of government has the ability to alleviate climate change?	Yes (1)	No (0)
Does the story suggest that some level of the government is responsible for climate change?	Yes (1)	No (0)
Does the story suggest solution(s) to climate change?	Yes (1)	No (0)
Does the story suggest that an individual (or group of people in society) is responsible for climate change?	Yes (1)	No (0)
Does the story suggest that the problem requires urgent action?	Yes (1)	No (0)

Human Interest Frame

Does the story provide a human example or "human face" of the effects of climate change?	Yes (1)	No (0)
Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)
Does the story emphasize how individuals and/or groups are affected by climate change?	Yes (1)	No (0)
Does the story go into the private or personal lives of people associated with climate change?	Yes (1)	No (0)
Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)

Conflict Frame

Does the story reflect disagreement between political parties, individuals, groups, and/or countries?	Yes (1)	No (0)
Does one party, individual, group and/or country reproach another?	Yes (1)	No (0)
Does the story refer to two sides or to more than two sides of the problem or issue?	Yes (1)	No (0)
Does the story refer to winners and losers?	Yes (1)	No (0)

Morality Frame

Does the story contain any moral message?	Yes (1)	No (0)
Does the story make reference to morality, God, and/or other religious tenets?	Yes (1)	No (0)
Does the story offer specific social prescriptions about how to behave?	Yes (1)	No (0)

Economic Frame

Is there a mention of financial losses or gains now or in the future?	Yes (1)	No (0)
Is there a mention of the costs/degree of expense involved?	Yes (1)	No (0)
Is there a reference to economic consequences of pursuing a course of action?	Yes (1)	No (0)

Endnotes for example articles 1 and 2

[1] If the Water Authority is constructing an additional intake for Lake Mead to alleviate issues with low water levels, then it seems to suggest that Water Authority is capable to some degree of alleviating the negative impacts of climate change. This warrants a "yes" answer to the question: "Does the story suggest that some level of government has the ability to alleviate climate change?"

[2] If the water authority is actively pursuing alternative sources due to current and future uncertainties of reliable water sources, then the story is suggesting that the issue requires urgent action. This warrants a "yes" answer for the question: "Does the story suggest that the problem requires urgent action?"

[3] This report released by the Southern Nevada Water Authority seems to indicate that climate change will affect water supplies in the future. This warrants a "yes" answer for the question: "Does the story emphasize how individuals and/or groups are affected by climate change?"

[4] This supports the notion that intervention by the Water Authority can alleviate the effects of climate change. Thus, a "yes" answer is warranted for the question, "Does the story suggest that some level of government has the ability to alleviate climate change?"

[5] Turf replacement initiated by the Water Authority is posited to use less water, and is thus one solution to climate change and water shortages. Thus, the answer "yes" is warranted for the question, "Does the story suggest solution(s) to climate change?"

[6] Good infrastructure maintained by the City of Las Vegas is posited to contribute to fewer issues with wasting water. Thus, water shortages from climate change will be overcome by efficient systems. This warrants a "yes" answer to both of the questions: "Does the story suggest that some level of government has the ability to alleviate climate change?" and "Does the story suggest solution(s) to climate change?"

[7] Again, repeated emphasis on the idea that efficient systems of the Water Authority will alleviate the negative impacts of climate change (i.e., mainly water shortages). Thus, a "yes" answer is warranted for both questions: "Does the story suggest that some level of government has the ability to alleviate climate change?" and "Does the story suggest solution(s) to climate change?"

[8] Identifying scientists who are also skeptics of human-caused climate change indeed refers to opposing sides of the climate change debate. As such, a "yes" answer is warranted to the following two questions: "Does the story reflect disagreement between political parties, individuals, groups, and/or countries?" and "Does the story refer to two sides or to more than two sides of the problem or issue?"

[9] Identification of a scientist who once supported, but now opposes, climate change is another example of opposition and disagreement between the individual and those who continue to support the idea of human-caused climate change. Thus, a "yes" answer is warranted for the following two questions:

"Does the story reflect disagreement between political parties, individuals, groups, and/or countries?" and "Does the story refer to two sides or to more than two sides of the problem or issue?"

[10] Climate change is illustrated as potentially harmful to human life. As such, a "yes" answer is warranted for the question, "Does the story provide a human example or 'human face' of the effects of climate change?"

[11] Politics and economic factors are mentioned as contributory factors to climate change believers and/or deniers. Thus, a "yes" answer is warranted for the question, "Is there a mention of the costs/degree of expense involved?"

[12] Discussion of institutions which vehemently propagate climate change support and suppress opposition warrants a "yes" answer to the following two questions: "Does one party, individual, group and/or country reproach another?" and "Does the story refer to two sides or to more than two sides of the problem or issue?

[13] The discussion of increased energy costs and decreased wealth because of climate change actions warrants a "yes" answer to the following questions: "Is there a mention of financial losses or gains now or in the future?" and "Is there a reference to economic consequences or pursuing a course of action?"

[14] The discussion of a crippled economy warrants a "yes" answer to the following question: "Is there a mention of financial losses or gains now or in the future?"

[15] Opposition between political officials and private companies warrants a "yes" answer to the following question: "Does the story reflect disagreement between political parties, individuals, groups, and/or countries?"

[16] Here is another demonstration of opposition between individuals and/or groups with reference to each side of the climate change debate. Violent oppositional actions are also included. As such, "yes" answers are warranted for the following questions: "Does one party, individual, group and/or country reproach another?" and "Does the story refer to two sides or to more than two sides of the problem or issue?" and "Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?"

[17] If the climate change debate is viewed as a war, then there will inevitably be winners and losers. As such, a "yes" answer is warranted for the following question: "Does the story refer to winners and losers?"

[18] Church was mentioned, metaphorically albeit, which nonetheless warrants a "yes" answer to the question, "Does the story make reference to mortality, God, and/or other religious tenets?"

Article 1

Colorado called most threatened
Las Vegas Review-Journal (NV) - April 17, 2013
Author: *Henry Brean*

An environmental advocacy group has named the Colorado the nation's most endangered river, just as federal forecasters sounded warnings about lower flows and deeper declines in Lake Mead.

American Rivers placed the Colorado at the top of its annual list because of drought, the emerging effects of climate change and what the group called "outdated water management practices" that have allowed demand to outstrip supply.

The Washington, D.C.-based group will roll out its rankings today, days after water supply experts downgraded their projections for the river and Lake Mead in the face of a second bad winter in a row in the mountains that feed the system.

In late February, forecasters were predicting a 13-foot drop in the reservoir east of Las Vegas over the next year. They now say there is a 65 percent chance that the lake will drop 23 feet by April 2014 and 30 feet by March 2015, when the water level could approach an all-time low.

Though snow is still falling in some parts of the Rocky Mountains, "there's no real way to pull this out of the fire at this point," said Randy Julander, who supervises the federal snow survey program in Nevada, Utah and California for the U.S. Department of Agriculture. "It's definitely going to be two bad years in a row."

Less snow in the mountains means lower flows in the Colorado, which provides drinking water to more than 35 million people from Denver to Los Angeles. The Las Vegas Valley relies on the river for 90 percent of its water supply.

It will mark the second year in a row that the Colorado will flow at less than half of its historic average.

As a result, forecasters now say it is likely that Lake Powell, on the Utah-Arizona border, will shrink low enough in the coming months to cut its downstream delivery to Lake Mead by 750,000 acre-feet. That's roughly three times as much water as the entire Las Vegas Valley used last year.

The surface of Lake Mead now sits at about 1,116 feet above sea level. Current projections call for it sink to 1,086 feet by April 2015, putting it within 5 feet of the all-time low of 1081.9 set in November 2010.

FORCED CUTBACKS POSSIBLE

If — or perhaps when — the lake hits the 1,075-foot mark, it will trigger a federal shortage declaration and force Nevada, Arizona and Mexico to cut their river use. It will also prompt a final vote by the Southern Nevada Water Authority board on whether to build a controversial, multibillion-dollar pipeline to tap groundwater across eastern Nevada.

Under normal conditions, Lake Powell releases at least 8.23 million acre-feet of water downstream to Lake Mead for use by Nevada, Arizona, California and Mexico.

If the latest projections from the U.S. Bureau of Reclamation come true, the release from Powell will be cut to 7.43 million acre-feet to allow the upstream reservoir to recover.

That will only exacerbate the math problem facing the West's most regulated and relied-upon river: The Colorado is overdrawn. Even in an average year, the river does not carry enough water to fill the allocations parceled out decades ago to seven Western states and Mexico.

"The Colorado River, the number one most endangered in the nation, is so over-tapped that it dries up to a trickle before reaching the sea," said American Rivers president Bob Irvin in a statement accompanying the group's report. "We simply cannot continue with status quo water management."

Water authority deputy general manager John Entsminger said he couldn't really respond to a report he hasn't seen, but he agreed that the Colorado is under serious strain.

He said those who share the river have responded with historic new cooperative agreements aimed at stretching supplies and sharing shortages. The latest was a treaty amendment with Mexico, forged last

year, that could restore water to the river's delta through a pilot program slated to start in 2014.

Entsminger said the new river projections are troubling, but the situation could be worse.

"If not for the efforts of the nation of Mexico, the Metropolitan Water District of Southern California and the SNWA, Lake Mead would be 10 feet lower than it is today," he said.

Those three entities are able to store their unused river allotments in the lake under interstate and international agreements forged over the last several years.

This year's snowfall was "almost a carbon copy" of last year's, Julander said, but the impact of below-average precipitation will be felt a lot more because the soil in the mountains was so dry and the river's reservoirs were already low.

'BONE CRUSHINGLY DRY'

The spring and early summer of 2012 were "bone crushingly dry and hotter than a two dollar pistol," he said, but the basin was still flush with water from 2011, which proved to be the third wettest winter on record.

Lake Mead has lost more than 90 vertical feet of water since drought took hold on the Colorado in 2000.

The drop has wreaked havoc on marinas and other recreational infrastructure at the lake and rattled the nerves of water managers across the region.

Entsminger said the authority has enough water in reserve to continue normal operations even if the lake sinks below 1,075 feet and into shortage. But no one wants to see what could happen if the lake keeps shrinking from there.

If the lake ever reaches the 1,025 mark, Hoover Dam will stop generating electricity, "and water quality becomes a real concern," he said.

The authority is in the midst of the most expensive construction project in its history — the more than $800 million third intake tunnel — to keep water flowing to the Las Vegas Valley should Lake Mead drop to 1,050 feet, low enough to shut down one of the community's two existing straws.

That project is slated for completion by the summer of 2014.

Article 2

5 federal climate change warnings for the Southwest

Las Vegas Review-Journal (NV) - May 9, 2014
Author: *Stephanie Grimes*

Global warming is already having widespread impact on everything from agriculture to urban health, according to a federal report released Tuesday, and the Southwest — the hottest, driest region of the country — faces unique challenges.

The National Climate Assessment highlighted five ways climate change is already impacting the region, which the report defines as California, Nevada, Utah, Arizona, New Mexico and Colorado:

Reduced snowpack and streamflows

Over the past 50 years, the Southwest has seen less late-winter snow, earlier snowmelt and earlier arrival of most of the year's streamflow, according to the report. Snow water equivalent, or the amount of water held in a volume of snow, is expected to decrease dramatically over the next century. In Nevada, it's projected to drop to 31 percent by 2099. Reductions in snowpack threaten an already delicate water situation in the region.

Climate change is also expected to increase the cost of improving and maintaining drinking water. Infrastructure improvements are already expected to cost Nevada $2.7 billion over the next 20 years even without accounting for climate change, according to the American Society of Civil Engineers. The state needs another $2.9 billion for wastewater infrastructure improvements over the same time period.

Threats to agriculture

The Southwest produces half the nation's high-value specialty crops, including almonds, artichokes and olives. Currently, 79 percent of the region's water is used in agriculture. Agriculture will see a threat from two places: A longer frost-free season, less frequent cool-air outbreaks and more frequent heat waves threatens the market value of crops with high water content like fruit. And a warmer, drier climate will put stress on agriculturally dependent economies as more water is transferred to urban areas.

Crop yields are expected to decrease as the frost-free season continues to lengthen, accelerating crop ripening and maturity.

Increased wildfire

The Southwest has become more vulnerable to wildfires over the past century due to climate change, increased drought, insect infestations and the accumulation of woody fuels and non-native vegetation. Climate change alone was responsible for a 650-percent increase in burned area in the western U.S. between 1970 and 2003.

Aside from destroying homes, excessive wildfire threatens public health, exposes slopes to landslides and erosion and can do millions in economic damage. The Carpenter 1 fire on Mount Charleston in July cost $20 million and burned about 44 square miles.

Sea level rise and coastal damage

Sea level has risen along the California coastline between 6.7 and 7.9 inches in the past century.

"In the last decade, high tides on top of this sea level rise have contributed to new damage to infrastructure, such as the inundation of Highway 101 near San Francisco and backup of seawater into the San Francisco Bay Area sewage systems," according to the report.

Rising sea levels over the next century expose the coastline to further erosion and threats of major floods, making especially vulnerable transportation infrastructure like highways, bridges and airports.

Heat threats to health

Of all U.S. regions, the Southwest has the highest percentage of people who live in cities, at 92.7 percent. Nevada is even higher, at 94.2 percent as of the 2010 census. Nationwide, 80.7 percent of the population is urban.

Along with increased demand for water, increased heat threatens urban infrastructures because a small problem can create a domino effect that impacts millions: The researchers cite an 11-minute power disturbance in 2011 that led to 1.5 million San Diego residents being without power

for 12 hours. The outage also caused problems with pumps and water service, leading to 1.9 million gallons of sewage being spilled near beaches.

Increased demand for air conditioning as heat intensifies also puts a strain on electricity demand, resulting in blackouts and brownouts.

Severe heat waves also aggravate preexisting health conditions and can result in death, especially in lower-income areas.

The Obama administration is hoping the report, which includes work by hundreds of scientists and government officials, will drum up renewed support for environmental initiatives including curbing heat-trapping gases. Opponents say the report is alarmist.

Introduction

The goal of this task is to assess how the *Las Vegas Review-Journal* portrays climate change over time, and what specific themes (or frames) may be present.

Some themes are more explicit, or blatant, than others, and may oftentimes go unnoticed to the average reader. Because of this, a particular "coding scheme" has been incorporated to uncover these otherwise hidden themes or frames.

Adherence to the coding scheme will provide you with the idea of what to look for in each article. The scheme contains a list of questions to which you will provide an answer of either *yes* or *no*.

Directions

You will code one article at a time from the *Las Vegas Review-Journal* by answering a series of questions on the subsequent pages, or code sheets. Answer each question to the best of your ability by circling *yes* or *no* in response to each question.

The last question asks you to identify the region(s) referenced by each article (if applicable). This includes whether articles refer to areas that are regional, national, and/or international.

Specifically, these areas are defined as follows:

- Regional: Southern Nevada specifically
- National: Any area(s) outside Southern Nevada and within the 48 contiguous states, Alaska and Hawaii
- International: Any area(s) outside of the 48 contiguous states, Alaska and Hawaii

See the coding examples to get a better idea for how to code your articles. Each article contains multiple endnote numbers that correspond to numbers in the example code sheets and endnotes section. For example, the number 1 following a paragraph or sentence corresponds to Endnote 1 and each question with 1 next to it. These endnotes provide specific reasoning for each *yes* answer.

The coding sheet asks you to code information that is mostly latent (underlying) content, which requires you to use your best judgment for interpretation. For example, one question asks, "Does the story make reference to morality, God, and other religious tenets?" The notion of "other religious tenets" for example, is not particularly defined for this exercise, which requires you to use your understanding of what may be a religious tenant for an appropriate answer.

Questions considered somewhat confusing in the past consist of the following:

- Does the story provide a human example or "human face" of the effects of climate change?
- Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?
- Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?

When questions such as these ask whether or not certain feelings are generated, do not interpret this personally, but judge whether or not the content could generate such feelings for another reader. Also, in regards to human examples, this refers to whether or not a story refers specifically to narratives of people, both individual and collective. Finally, when answering the question about the presence or absence of visual information, consider whether the article contained any information described in a visual manner, where certain wording could conceivably evoke imagery in a reader's mind.

CODING SHEET

Directions. On the upper half of this page, please identify the requested information noted in the article, then complete the questions located on the lower half of this page. If you are unable to locate any of the requested information in the article, please write "missing" in the space provided.

Name of coder: _____

Case number: _____

Name of newspaper: _____

Author: _____

Source: _____

Date of publication (mm/dd/yyyy): _____

Starting page of article: _____

Number of pages: _____

Article type (circle one)

News article

Editorial

Letter to the editor

other

Case number: _____

Attribution of Responsibility

Does the story suggest that some level of government has the ability to alleviate climate change?	Yes (1)	No (0)
Does the story suggest that some level of the government is responsible for climate change?	Yes (1)	No (0)
Does the story suggest solution(s) to climate change?	Yes (1)	No (0)
Does the story suggest that an individual (or group of people in society) is responsible for climate change?	Yes (1)	No (0)
Does the story suggest that the problem requires urgent action?	Yes (1)	No (0)

Human Interest Frame

Does the story provide a human example or "human face" of the effects of climate change?	Yes (1)	No (0)
Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)
Does the story emphasize how individuals and/or groups are affected by climate change?	Yes (1)	No (0)
Does the story go into the private or personal lives of people associated with climate change?	Yes (1)	No (0)
Does the story contain visual information that might generate feelings of outrage, empathy-caring, sympathy, or compassion?	Yes (1)	No (0)

Conflict Frame

Does the story reflect disagreement between political parties, individuals, groups, and/or countries?	Yes (1)	No (0)
Does one party, individual, group and/or country reproach another?	Yes (1)	No (0)
Does the story refer to two sides or to more than two sides of the problem or issue?	Yes (1)	No (0)
Does the story refer to winners and losers?	Yes (1)	No (0)

Morality Frame

Does the story contain any moral message?	Yes (1)	No (0)
Does the story make reference to morality, God, and/or other religious tenets?	Yes (1)	No (0)
Does the story offer specific social prescriptions about how to behave?	Yes (1)	No (0)

Economic Frame

Is there a mention of financial losses or gains now or in the future?	Yes (1)	No (0)
Is there a mention of the costs/degree of expense involved?	Yes (1)	No (0)
Is there a reference to economic consequences of pursuing a course of action?	Yes (1)	No (0)

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ARTICLES UNDER REVIEW

Holley, J. R. (submitted 2014, November). Gifford Pinchot and *The Fight for Conservation*: The emergence of public relations and the conservation movement, 1901–1910. *Journalism History*.

Holley, J. R., & Parker, R. E. (submitted 2014, November). "Official" reality: The socio-historical evolution of the Bureau of Labor Statistics. *Labor History*.

Holley, J. R. (submitted 2014, November). *The Wolf of Wall Street* and Martin Scorsese's apotheosis of auteurism: Heteronormativity, hypermasculinization, and neoconservatism. *Journal of Film and Video*.

REFEREED CONFERENCE PRESENTATIONS

Holley, J. R. (2014, February). The Rolex watch: An explication of environmental degradation and cultural motivation. Presented at the Far West Popular Culture Conference, Las Vegas, NV.

Holley, J. R. (2014, February). Print media coverage of anthropogenic climate change and audience perceptions. Presented at the Far West Popular Culture Conference, Las Vegas, NV.

Holley, J. R., & Parker, R. E. (2014, October). "Official" reality: The socio-historical evolution of the Bureau of Labor Statistics. Presented at the International Organization of Social Sciences and Behavioral Research Conference, Las Vegas, NV.

Parker, R. E., & **Holley, J. R.** (2014, October). Conspiracy theories in the sociology classroom. Presented at the International Organization of Social Sciences and Behavioral Research Conference, Las Vegas, NV.

WORKS IN PROGRESS

Holley, J. R. (submitted 2014, November). The development of coding instrumentation for identifying frames in media portrayals of climate change. Submitted to the Broadcast Education Association Conference, Las Vegas, NV, April 2015.

Holley, J. R., & Parker, R. E. (accepted 2014, November). The impact of technological automation on the growing instability of contemporary media work. Forthcoming presentation at What is Journalism? Exploring the Past, Present, and Future in Portland, OR, April 2015.

Parker, R. E., & **Holley, J. R.** (accepted 2014, November). Relative risks surrounding the home defense firearm. Forthcoming presentation at the Western Social Science Association Conference in Portland, OR, April 2015.

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