

CITIZEN JOURNALISM AS A SUPPLEMENT TO REPORTING ON ENVIRONMENTAL
ISSUES: EXAMINING THE VIEWPOINT DIVERSITY OF ARCTIC OIL DRILLING IN
CITIZEN-INVOLVED NEWS

By

Kanni Huang

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ABSTRACT

CITIZEN JOURNALISM AS A SUPPLEMENT TO REPORTING ON ENVIRONMENTAL ISSUES: EXAMINING THE VIEWPOINT DIVERSITY OF ARCTIC OIL DRILLING IN CITIZEN-INVOLVED NEWS

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Citizen journalism plays the role of supplementing legacy news outlets by providing alternative angles possibly absent from those outlets. Arguments about environmental issues in mainstream news outlets usually focus on limited viewpoints, and citizen journalism has the potential to increase the visibility of minor viewpoints about environmental issues. Using the hierarchical model of influence on news content (Shoemaker & Reese, 1991), this study examines different levels of citizen-involved activities to predict the presence of minority viewpoints in the news. Instead of treating citizen journalism sites as homogeneous organizations, this study looks into several levels of citizen-involved activities (individual vs. organizational) and features (online-only, opinionated, non-profit, community-focused, and alternative mission) to incorporate different ways and formats of citizen participation in newsmaking.

Arctic oil drilling was selected as a case study because of its wide range of geographic impact (local, national, and global) and the potentially diverse viewpoints that can be advocated. A sample was collected from the *Google News* database and environmental citizen sites on the Knight Community News Network and the Columbia Journalism Review. A content analysis was conducted using news stories and opinion pieces appearing between January 1, 2012, and December 31, 2015. An eight-predictor logistic regression model was computed to test whether citizen journalism increases the number and proportion of minority viewpoints presented in the

media. Two additional logistic regression models were applied to compare predictors of minority viewpoints among professional and citizen journalists.

This study contributes to an understanding of the hierarchical model of influence by testing the model under the circumstances where media routines and organizational influences differ significantly from traditional media settings. Results show that the chance citizen writers express opposing and minority viewpoints is solely determined by the norms of journalistic format—new insights are usually given in opinion pieces rather than news stories. Apart from journalistic format, professional journalists' work is also predicted by available resources in media routines and by regional audience's preferences outside the news organizations. The professional routines and requirements to fulfill the organization's goals do not apply to citizen journalists' work. Citizen authorship or stories published on sites accepting user-submitted stories do not add new or alternative viewpoints to the issue discussion. Instead, citizen journalists tend to defend their positions by giving more popular rationales—for example, ecological sustainability. Citizens' work published in news media helps strengthen the popular viewpoints instead of supplementing alternative views into public discussion. Methodologically, this study provides a quantifiable and replicable measurement of viewpoint diversity that can be applied to examine different public issues in media content.

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This dissertation is dedicated to my parents.

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INTRODUCTION

Information presented in the news can be used for social purposes, helping personal and professional lives, entertaining, and making decisions on public affairs (Purcell, Rainie, Mitchell, Rosenstiel, & Olmstead, 2010). Among different purposes, being a better citizen and talking about news socially are the top reasons for using news information (Lacy & Rosenstiel, 2015).

When news is used for citizenship, the principle of diversity is an important element to evaluate the quality of journalism products (Lacy & Rosenstiel, 2015). In communication policy, diversity policies can be justified by the concept of the marketplace of ideas (Napoli, 1999). The First Amendment tradition emphasizes that myriad ideas and opinions derived from a wide range of sources should be disseminated to citizens in order for decision-making and a well-functioning democracy. Thus, the marketplace of ideas is essential to achieve an effective democracy, as the First Amendment stresses. Diversity policies—including source, content, and exposure diversity—are made to achieve the function of the marketplace of ideas.

With the emergence of the Internet, non-professional journalists have become more active in journalism. Several different terms have been used to describe a phenomenon in which news production is made increasingly by enthusiastic citizens or ordinary people. These terms include “amateur journalism,” “grassroots journalism,” “citizen journalism,” and “participatory journalism” (Fröhlich, Quiring, & Engesser, 2012). In this study, the term citizen journalism refers broadly to citizen-involved news products, including ownership, production, or offering resources/materials in news-making processes. Although the functions of citizen journalism vary, promoting civic engagement, or being an informed and active citizen, has a prominent role.

Some scholars define citizen journalism as the best sources for first-hand witnesses in crisis news (Allan, 2012; Bal & Baruh, 2015). Others believe that it can fulfill democratic

functions to encourage active engagement in political conversation, political movements, and social change (Gillmor, 2006; Rodrigues, 2010). Online surveys on citizen journalists and news consumers provided evidence on the role of citizen journalism as “populist mobilizer”—distributing information to help the public understand and discuss public affairs and resolve social problems (Chung, 2009; Chung & Nah, 2013).

Another important function that citizen journalists fulfill is to provide alternative information that is absent in traditional media (Fröhlich et al., 2012). In a survey of 153 German citizen journalists, citizen journalism was perceived as a space for more varied opinions than traditional journalism (Fröhlich et al., 2012). Among varied topics and information, citizen journalism has been found to heavily focus on local/rural/regional issues. One content analysis study compared websites of daily newspapers, citizen news sites, and blog sites, and concluded that citizen sites can complement daily newspapers by covering more neighborhood details, which are usually absent in traditional media due to market service (Lacy, Duffy, Riffe, Thorson, & Fleming, 2010).

In the context of environmental news, environmental issues are often involved in local/rural/regional discussion, and local media coverage potentially provides local angles on environmental debates that differ from national or prestige media (Feighery, 2011). Citizen journalism supplements traditional media by providing details of local information and angles (Lacy et al., 2010) and, thus, potentially enriches the content of environmental news with diverse viewpoints.

The goal of this study is to examine whether citizen journalism complements traditional media when environmental issues are reported. This study aims to examine several features of citizen-engaged journalism to predict viewpoint diversity. The increasing non-profit ownership,

citizen reporters, online-only media, and citizens' voices call for examining whether environmental issues are presented under more diverse viewpoints through citizen-engaged journalism.

The case study chosen for this analysis is Artic oil drilling, a contentious environmental topic that has received much media, environmental organization, oil company and citizen attention in the United States. The time period of study is 2012 to 2015, when drilling in Alaska was of particular concern because of the stakes involved: potentially high profits for the oil companies, but potentially devastating oil spills for the environment and the people whose lives depended on the environment.

Results suggest that citizen journalism supplements professional journalism through being an information source, writing opinion pieces, and writing for non-profit media organizations. The "new" form of citizen journalism, including authoring news stories or publishing on sites accepting user-submitted stories (USS), do not contribute to content diversity in the environmental issue. Instead, citizen journalists and USS sites strengthen the popular views already presented by professional journalists. The evidence demonstrates the importance of resources in the newsroom, the increasingly popular format of citizen journalism, and the not-for-profit goal of a media organization. Media policies supporting the above conditions will facilitate public understanding of the environmental issue in order to become a well-informed citizen in the society.

CHAPTER 1

LITERATURE REVIEW

Introduction

This chapter begins by examining prior research on content diversity in environmental reporting, and identifies an important gap in that research that forms the focus of this study. The remaining sections of this chapter will first define several important concepts in this study, and then present the theoretical framework—the hierarchical model of influences on media content. It will be reviewed in the fields of citizen journalism and environmental communication. Hypotheses and research questions will be presented based on the findings of previous research.

Research Related to Viewpoint Diversity in Environmental Journalism

The idea of viewpoint diversity is rich in broader literature (Ho & Quinn, 2009; Napoli, 1999) but curiously underdeveloped in environmental journalism. Environmental news is a useful focus for examining viewpoint diversity because two factors—geographical distance and limited resources in the environmental beat—are distinctive influences on the content. Relevant studies in environmental journalism have only focused on examining source diversity, and thus leave knowledge gaps in examining viewpoint diversity. This study will use professional and citizen journalism’s coverage of Arctic oil drilling to address these gaps.

Source diversity in environmental journalism. For environmental reporting, the fundamental democratic demand is that all issue-related stakeholders have an opportunity to influence public opinion and decision-making processes (Smith & Norton, 2013).

The study of news sources in environmental reporting showed the failure of news media as an equal reflection of all types of stakeholders (Smith & Norton, 2013). In environmental news, journalists tend to use similar types of sources while ignoring others (Sachsman, Simon, &

Valenti, 2006). However, the results of prior research differ on the types of sources preferred in environmental news. Some scholars found that government sources and environmental groups were the most commonly cited sources in environmental news (Smith & Norton, 2013). Also, an earlier content analysis on Denmark's environmental news during the 1980s showed that Greenpeace represented more than one-fifth of citations in environmental news (Hansen, 1991).

Other research results in different findings. Lacy and Coulson (2000) found that governmental and business sources dominated environmental reporting and that non-official sources, such as consumers and environmentalists, were hardly cited. Similarly, Reis (1999) studied Brazilian newspapers and found that the primary source in environmental reporting was government representatives, including directors of environmental agencies, ministers, diplomats, and heads of state. Similar results were found in New Zealand metropolitan newspapers, in which more than three-quarters of cited sources were political and industry sources (Craig, 2007).

Different explanations have been given to predict source diversity in environmental reporting. Geographical distance and the nature of grassroots voices are two distinctive conditions in this context. First, the proximity of news outlets to the event location can determine types of news sources used in a news story (Berkowitz & Beach, 1993; Voakes, Kapfer, Kurpius, & Chern, 1996). If news events occur farther away from the local media, the use of official sources will minimize the risks of information errors when journalists have little knowledge about the events. For those that happen closer to the local media, journalists are able to cite more unaffiliated sources to incorporate community angles. Martin (1988) compared the variety of sources used among *New Albany Tribune*, *Courier-Journal* and *The Times*, and she found that

New Albany Tribune carried a wider range of news sources than the other two media because the former outlet is located closest to the event community.

Second, the absence of environmental journalists in smaller-scale media decreases source diversity. The environmental movement was initiated in the 1970s. Since then, American journalism has developed a specialized beat to report on environmental issues. National news agencies are more likely to employ environmental journalists to report on environmental issues, while specialized reporters are usually absent in smaller local media (Sachsman et al., 2006). Journalists assigned to environmental issues in smaller local media do not have time to cultivate sources (Friedman, 1991). They may encounter difficulties to finding information sources that can help them interpret environmental information.

Therefore, past research has identified geographical distance and resources available to environmental news as important factors influencing content diversity, but has not yet closely examined the role of citizen journalism to supplement environmental content.

Fill in the gap: Citizen participation in viewpoint diversity.

To fill in the gap in the field of environmental journalism, this study selects Arctic oil drilling as the case study to examine whether citizens contribute to viewpoint diversity.

The U.S. Geological Survey (2008) estimated that a quarter of the world's undiscovered conventional oil and gas was in the Arctic, more than 80 percent of it in offshore areas and one-third of the oil held in reserve by the United States. Arctic Alaska not only holds large quantities of hydrocarbons and minerals, but also marine species and fresh water. Thus, from an environmental, economic, cultural, and social perspective, energy policies that allow drilling undiscovered oil in this pristine natural environment are controversial.

The decision-making process of energy policy should allow citizens to express their views and choices based on individual values and worldviews (Stagl, 2006). Decision-making is a mutual learning process among representatives, experts, and citizens, rather than a top-down choice made solely by policy makers. Public participation can trigger the learning process and facilitate mutual understanding (Webler, Kastenholz, & Renn, 1995). To initiate public participation and discussion, news media can serve as the public sphere, allowing citizens' voices to be heard (Schudson, 1982).

However, the role of news media serving public participation in environmentally related policies has received little attention in environmental journalism. Research on environmental news content has mostly focused on assessing the accuracy of presenting scientific knowledge and comparing news frames among different countries. Studies assessing scientific knowledge emphasized one-way information delivery from scientists to citizens (Bell, 1994; Nissani, 1999). Research on news frames stressed the representation of information from news media to citizens (Brossard, Shanahan, & McComas, 2004; Dirikx & Gelders, 2010; Olausson, 2009). What matters to citizens and how well news media allow public engagement are sparse in previous research. The examination of news media serving as the channel for mutual communication, instead of one-way information delivery, is missing in environmental journalism. Therefore, this study examines to what extent citizens participate in the news content and increase different viewpoints addressed to allow for social learning in the decision-making process.

Important Concepts

Citizen journalism. The word “citizen” distinguishes from professional journalists by the potential of adopting journalistic norms. With professional journalism training, individuals are more likely to operate under journalistic values and norms—such as fairness, accuracy, and

objectivity—and this criterion determines who is considered a professional journalist (Abbott, 1988; Shin, 2015). Journalists’ professionalism comes from education or employment in news organizations (Beam, Weaver, & Brownlee, 2009). Therefore, this study distinguishes citizen contributors from professional journalists by formal journalism education and experiences working full-time in news organizations.

Today, citizens engage in newsmaking in varied ways, and scholars have differentiated citizen involvement into different levels (Holt & Karlsson, 2015; Outing, 2005). The first level of citizen-involved news is adopting user-generated content (UGC). Public comments can be attached to a news story or directly embedded into the news content. User-submitted photos or videos can be used as information sources. Opinions from knowledgeable audience members or questions from curious readers can guide a story or an interview. They can be presented in the content or invisibly incorporated into a story. The second level of citizen journalism is using user-submitted stories (USS). Citizen-authored stories or blog posts can be incorporated into traditional news sites or citizen journalism sites, with or without editorial oversight. In sum, citizens can participate in newsmaking by providing information or by authoring an article on traditional or citizen-journalism sites.

At the organizational level, citizen journalism sites are usually referred to as digitally distributed and not-for-profit news websites, where the majority of content is USS (Lacy et al., 2010; Nee, 2013). This study questions whether citizen journalism complements traditional journalism by considering different levels of factors. At the individual level, citizens can participate in newsmaking by providing information or by authoring an article. At the organizational level, citizen journalism sites have three main features: digital-only distribution, not-for-profit status, and mostly user-submitted content.

In this study, the term *citizen journalism* refers broadly to citizen-involved news products, including ownership, production, or offering resources and materials in newsmaking processes. The operational definition of citizen journalism adopted for this study includes two types of citizen-involved activities at the individual level—citizen authorship and citizen sources—and news sites with five different features at the organizational level—online-only, non-profit, accepts user-submitted stories, has alternative missions, and is community focused. The sources of citizen journalism in the analysis are news articles with any one of the above citizen-involved features drawn from Google News, Knight Citizen News Network, and *Columbia Journalism Review*.

Viewpoint diversity. Viewpoint diversity is the most central element to the First Amendment tradition (Napoli, 1999). The public has right of access to a diversity of ideas and, thus, becomes well-informed citizens to participate in public decision-making. The Federal Communications Commission (FCC) defined “viewpoint diversity” as “the availability of media content reflecting a variety of perspectives” (*Report and order and notice of proposed rulemaking* 2003, p. 8).

This study defines viewpoint diversity as diverse positions toward an issue and diverse rationales supporting the position in the news. Ideally, well-informed citizens who participate in public decision-making are those who can validate their decisions by considering conflicting views and who can debate, discuss, and defend their decisions (Wilhelm, 1998). Therefore, desirable media content aimed at helping the decision-making process should provide not only diverse positions, but also rationales that allow citizens with opposing views to negotiate via democratic deliberation.

Journalistic formats and viewpoint diversity. News stories and opinion pieces are two formats of news products. Fico et al. (2013) defined “news stories” as “articles that provided explicitly sources of information and exhibited no purposeful bias” (p. 158). Journalists do not insert personal opinions into news stories. Instead, they are required to provide balanced viewpoints through information sources.

Opinion pieces can serve as a journalistic forum where policy makers, academics, other experts, or media commentators, affiliated or non-affiliated with the media outlet, present their opinions about a news topic (Golan & Wanta, 2004). Opinion pieces—including editor’s columns, op-eds, letters to the editor, and blog commentaries—are critical and judgmental in nature, and the desired content within them is to provide diverse viewpoints. This is especially true for op-eds. As Golan and Wanta referenced the editorial statement in *The New York Times* in 1970 when the op-ed was first introduced, “The objective... is to afford greater opportunity for exploration of issues and presentation of new insights and new ideas...” (Golan & Wanta, 2004, p. 71). Both news stories and opinion pieces seek to achieve the concept of a free-flowing marketplace of ideas (Golan & Wanta, 2004). To achieve the goal, news stories are expected to cite diverse sources to increase content diversity, and opinion pieces, ideally, will present viewpoints through different contributors debating an issue.

Viewpoint diversity and minority viewpoints. Diversity is a dual-concept that refers to the number of categories and the evenness of the elements among categories (Junge, 1994; McDonald & Dimmick, 2003). To examine whether citizen journalism supplements traditional media by providing more diverse viewpoints, looking at whether citizen journalism adds new viewpoint categories and increases the proportions of viewpoints allotted to categories with smaller counts is necessary. In other words, if citizen journalism is more likely to present

viewpoints assigned to new or minority categories of an issue, the citizen-involved news products will eventually increase the viewpoint diversity compared to traditional media. The viewpoints assigned to new or minority categories are called “minority viewpoints.”

Grassroots sources. This study uses the term “grassroots sources” to incorporate several types of information sources, including environmental groups, non-environmental groups, small business, protestors, and citizens. The term “grassroots” has been granted at least two meanings. First, grassroots refers to the bottom-up decision-making in comparison with the top-down style. Uphoff (1993) differentiated decision-making organizations from top to bottom into ten levels—international, national, regional, district, subdistrict, locality, community, group, household, and individual levels. Grassroots refers to locality, community, and group levels of decision-making that does not have administrative or political authority. By this definition, this study incorporates small business, environmental groups, and non-environmental groups as grassroots sources.

The second meaning of grassroots refers to citizen participation in the news. Gillmor (2006) used the term “grassroots journalism” to refer to a form of journalism joined by people who were excluded from the mainstream media but spread their words through alternative press. The goal of grassroots journalism is to fulfill democratic functions to express alternative voices (Fröhlich et al., 2012). In this sense, the grassroots sources in this study include any individuals who are not affiliated with any organizations and express their opinions on an issue or a news event through news media.

Theoretical Framework

This study is guided by the Shoemaker and Reese (1991, 2013) hierarchical model of influences on news content to examine viewpoint diversity in both traditional and citizen-engaged journalism. This model was selected because it is the most comprehensive model to

explain why media content is presented in ways that the audience consumes. The model is built on classic content research and theories on media sociology, a fruitful research area in journalism to study newsrooms and their news products.

For this study, two levels of influences that were not incorporated in the model were also expected to be important. At the level of individuals, content is directly influenced by media workers' socialization and attitudes. At the level of social systems, content is influenced by the pressure to maintain the status quo. The former level is mostly related to social psychological factors, and the latter level is mostly used in comparative studies in the field of global communication, both of which are beyond the scope and focus of this study. The conceptual framework therefore is based on three levels of the Shoemaker and Reese (1991, 2013) model and adds variables of journalistic formats, user-submitted stories sites, and mission type to the level of media routines and organizational factors of the model.

In the Shoemaker and Reese (1991, 2013) model, lower-level factors are constrained by higher-level factors, especially in traditional news organizations. The personal characteristics of journalists, at the lowest level, are constrained by a series of higher-level factors, including media routines, organizational structures and resources, institutional relationships with social actors, and societal ideology. For individual blogs that may not have the same conditions as traditional news organizations, higher-level factors will be tested for exploratory and comparative purposes.

The variables of media routines. According to Shoemaker and Reese (1991, 2013), news content created by individual professional journalists is influenced by the media system and how it gathers information. Three factors relate to the systematic media routines: (a)

journalistic norms that guarantee acceptable content to the audience, (b) the medium's capability of processing news, and (c) resources or suppliers available to journalists.

Journalistic norms. Using citizen-submitted stories is an important feature of citizen journalism. Citizen journalism was operationally defined as the content originating from volunteers or community members who were not professional journalists (Lacy et al., 2010). Citizen contributors are those who are not trained as professional journalists through education or at the workplace. They simply submit news or commentaries outside the news organization and, thus, are less likely to be bounded to journalistic norms. For example, citizen journalists are less likely to regard themselves as neutral mediators (Fröhlich et al., 2012). Instead, citizen journalists tend to fill niches that traditional journalists do not offer. In this sense, citizen journalists potentially provide alternative content than traditional news. Therefore, the first variable at the level of media routines will examine stories authored by professional journalists and by citizen contributors.

Another variable related to journalistic norms is the distinction between news stories and opinion pieces. One content analysis on 962 stories published by newspapers and citizen journalism sites showed that opinion articles were 3.8 times more frequently shown on citizen journalism sites than on newspaper sites (Carpenter, 2008). In other words, opinion pieces are a popular format in citizen journalism. The objective of offering opinion articles is to provide new insights on an issue, thus allowing alternative viewpoints to be voiced (Golan & Wanta, 2004). Therefore, this study examined whether the journalistic formats—news stories and opinion pieces—relates to viewpoint diversity.

Medium's capacity. Citizen journalism has had more opportunities to survive since the emergence of the Internet. The lower cost of initiating an online-only news site helps citizens to

create news content on the Internet. As Shoemaker and Reese (1991) highlighted, different news media have their own capacities to process news. For some online-only news sites, journalists tend to have more time pressure and economic demands, so being faster and closer to the public is an important newsroom value (Møller Hartley, 2013). Others who do not publish daily online content differ from other media by valuing audience participation in news production processes (De Keyser & Raeymaeckers, 2012; Nee, 2013). Shoemaker and Reese's (2010) model has illustrated how print and broadcast journalists are different by ways of transmitting messages, economic support, and frequency of publication. Journalists working for the online-only medium are very likely constrained by similar factors. Therefore, this study examined the processing variable between online-only and other types of media.

Resources. The gatekeeping processes is another important feature in citizen journalism as journalists filter out certain information from their sources (Shoemaker & Vos, 1996). The gatekeeping process has developed into a media routine by which official news release or social elites become the most frequently cited sources (Gans, 1979; Shoemaker & Vos, 1996). Previous studies showed that government officials and business sources were cited most frequently in environmental news (Craig, 2007; Horsbøl, 2013; Lacy & Coulson, 2000; Reis, 1999). The studies indicated the lack of grassroots voices presented publicly through news media.

The proportions of the grassroots sources cited in a story seemingly vary by news topics. In a content analysis on general coverage of 962 stories published on newspaper and citizen sites, Carpenter (2008) found that citizen journalism was more likely than online newspapers to adopt unofficial sources. Another content analysis on more than 7,000 stories about local governments published by citizen sites and newspapers showed that citizen sources were not cited as often as local government officials on citizen news sites (Fico et al., 2013). In other words, citizen

journalism incorporated more unofficial sources in general news topics, but cited fewer citizen sources in the coverage of local political issues.

The use of more unofficial sources on general news coverage can be explained by one qualitative content analysis on 10 municipal online pages of a regional Belgian newspaper (Paulussen & D'Heer, 2013). The study found that citizen journalists were more likely to report on human interest stories about cultural events, health, sports, and school life, based on their personal experiences, and used themselves as the primary source due to the lack of access to official sources. For political issues, the use of fewer citizen sources by citizen journalism can be attributed to sites' small budgets and limited staff members (Fico et al., 2013). Due to the more restricted resources offered to citizen journalists, they are unable to spend more time on seeking information sources. The public relations (PR) spokespersons' and journalists' frequent contacts can save reporters' time and speed up telling stories. Reich and Godler (2014) used the term "time subsidy" to explain PR's role in news production and how powerful sources shape the news under reporters' time pressure. By interviewing reporters from Israeli news media, Reich and Godler (2014) found that the more time journalists spent on a story, the more diverse sources they used and the fewer PR and frequent sources they cited.

Environmental stories on citizen journalism sites can be reported by offering personal experiences, as well as by debating on public policies. Local residents can submit their own stories or other news content based on personal experiences connected to their local environment. However, sourcing citizens or community groups in environmental news possibly also requires journalists to spend time cultivating relationships. To this author's knowledge, there was no study examining the use of sources by citizen journalists reporting on environmental issues. Thus, this study will explore whether grassroots sources are more or less likely to be used

by citizen journalists and, once they are used, whether they provide alternative viewpoints to environmental issues.

Generally speaking, the use of grassroots voices does not necessarily indicate that viewpoint diversity correspondingly increases. Scholars have questioned the conventional wisdom that source diversity facilitates different viewpoints in the news. Voakes and his colleagues (1996) point out, for example, that a variety of sources cited in a news story may contain an unidimensional viewpoint, while fewer sources quoted in a story can deliver various opinions. In other words, source diversity does not guarantee that journalists balance a news topic by providing opposing or dissenting sources. Similarly, Kuban (2007) found that there was no statistical significance between the increase of the number of sources and the number of claims and counter-claims in news stories. Raeymaeckers, Deprez, De Vuyst, and De Dobbelaer (2015) summarized De Keyser's (2012) and Van Leuven's (2013) studies (in Dutch) that the increased participation of citizens and advocacy groups as sources did not add new insights into the news.

In the context of environmental news, no empirical research was found to examine the relationship between source and viewpoint diversity. However, qualitative studies have observed the role of NGOs in environmental news. Carvalho (2000) analyzed how three prestige media represented the climate change issue by considering different actors between 1985 and 1997. Environmental NGOs in the early years often led an oppositional discourse against government and industry, but in more recent years, the NGOs have collaborated with them to promote solutions of climate change through the press. Eklof and Mager (2013) observed articles collected from Swedish news coverage and the Google search engine. They found that articles from both media showed the dominance of governmental, business, and academic sources as the

alliance that took the same position on the issue of biofuel controversy. The NGOs, however, were outside of the alliance when presented in media.

In light of the existing literature on environmental journalism, assessments on whether citizen journalists cite more grassroots sources and how these sources contribute to viewpoint diversity remain too premature to make conclusions. This study explores the prevalence of grassroots sources used by citizen journalists and whether the presence of these sources indicates the presence of minor viewpoints in the news. Therefore, the variable information sources—grassroots and other sources—was be examined in terms of viewpoint diversity.

The variables of organizational factors. The media organizations' goal is an important factor of their content. For most of them, the primary goal is to make a profit (Shoemaker & Reese, 1991, 2013). However, this is not always true for digital-based outlets. According to an online database (Silk Data Publishing Platform, 2014), a very large proportion (37.4%) of online-only startups consists of not-for-profit news platforms. The non-commercial goal of online media is an important factor of media content. A content analysis of news on 198 radio station websites showed that ownership was related to news content. News sources cited by public radio stations showed greater diversity than those sourced by commercial stations (Lacy et al., 2013). Therefore, this study will examine ownership (non-profit and commercial) at the level of organizational factors.

Other than the economic purpose, other goals may be built into the primary goal, and serving the public is one of them (Shoemaker & Reese, 1991). The increasing convergence between professional and citizen-made news in a commercial media organization has been found worldwide¹ (Deuze, Bruns, & Neuberger, 2007). Through incorporating user-submitted stories

¹ Several examples of commercial news sites that publish user-submitted stories include CNN.com, ChicagoTribune.com, and Economist.com.

into online content, media organizations fulfill the goal of engaging the public and encouraging public connectivity (Deuze et al., 2007). This current study argues that those websites that do not exclude non-professional news stories and, instead, try to serve the public by accepting citizen-submitted stories are different from others. As Deuze et al. (2007) suggested, professional sites incorporating citizen-made news created a culture of the combination between industrial and participatory journalism, and their products were not simply cheaper alternatives to professional content. Therefore, the second variable at the level of organizational factors is the adoption of user-submitted stories.

Another organizational factor that may influence media content is the mission of news outlets. Environmental issues in the news can be presented in different perspectives and frames, and they have been connected to the goals set by different media outlets. Previous studies found that environmental issues reported in mainstream media usually provide market-based solutions to environmental problems, while in left-wing or environmental news media, the capitalist modes of production are questioned and ecologically sustainable solutions are offered (Brand & Brunnengräber, 2012; Hopke, 2012). This study suggests the variable mission types (environmental vs. general sites) to predict the viewpoint diversity in environmental news.

The variable of social institutions

When predicting media content at the level of social institutions, Shoemaker and Reese (2013) suggested that the more the media targeted certain groups of the audience, the more likely that their content reflected the targeted audience's interests. Thus, the content of newspapers targeting community readers may be accommodating to serve the community members' preferences (Shoemaker & Reese, 1991). Sensitivity to communities was also important for local television stations (Shoemaker & Reese, 1991). The content analysis research on stories about

George W. Bush's speeches and the Bush Administration indicated that community support, or the political atmosphere in communities, may influence whether a political party is presented positively in the news (Eshbaugh-Soha & Peake, 2008; Peake, 2007).

For environmental issues, local media coverage can help provide local angles on environmental debates that served local residents and are different from what is presented in national or prestige media. For example, Feighery (2011) examined the media coverage of atomic testing in Nevada and found that *The New York Times* mainly focused on national security rather than its health effects. The same issue presented in local news in Utah painted a different picture. The local media coverage reported the bomb's impact on area residents' health.

As mentioned earlier, citizen journalism serving regional communities supplements traditional media by providing details of local information and angles (Lacy et al., 2010), and thus, this study will examine whether media outlets that serve communities close to an environmental event are more likely to provide viewpoints that differ from those in distant media outlets.

Study Goal

This study focuses on different levels of citizen journalism to determine whether citizen journalism complements professional news sites to increase viewpoint diversity. The study examines professional vs. citizen journalists, grassroots vs. other sources, USS sites vs. others, news stories vs. opinion pieces, online-only vs. other media, not-for-profit vs. commercial organizations, and environmental vs. general goals.

Hypotheses & Research Questions

To examine whether different levels of citizen-involved activities complement the viewpoint diversity of traditional news content, this study proposed seven hypotheses and four

research questions under Shoemaker and Reese's (1991, 2013) hierarchical model on media content. The news topic chosen is environmental, and the research questions and hypotheses will thus be examined in the context of environmental news.

Media routines. At the level of media routines, media workers tend to follow journalistic norms with available resources in a specific type of media to generate news stories or opinion pieces (Shoemaker & Reese, 1991). This study argues that citizen contributors differ from professional journalists for several reasons: a lack of professional training, preferences for writing opinion pieces, limited use of official sources, and working for more specific media types. These factors generate a different media routine for citizen contributors and, thus, influence how they present an environmental issue, especially when representing minority viewpoints. Therefore, this study proposed the following:

H1a: News authored by citizen contributors will be more likely to include minority viewpoints than news authored by professional journalists.

H1b: Opinion pieces will be more likely to present minority viewpoints than news stories.

H1c: News published on online-only news sites will be more likely to present minority viewpoints than news published on traditional news sites.

Among all the factors at the level of media routines, what resources are available to citizen contributors in environmental reporting remains unclear in the literature. To explore the use of grassroots sources by citizen journalists and the relationship between the source and the viewpoint, this study addresses two research questions:

RQ1a: Will news authored by citizen contributors be more likely to use grassroots sources compared to news published by professional journalists?

RQ1b: Will citizens or advocacy groups (grassroots sources) be more likely to present minority viewpoints than other types of sources?

Organizational factors. At the level of organizational factors, Shoemaker and Reese (1991) suggested the importance of the goal set by media organizations. Generally, the primary goal is to make a profit so that the comparison between commercial and not-for-profit organizations and their news products is crucial at this level. To achieve the primary goal, media organizations may set up different goals to serve targeted audiences. The service of accepting user-submitted stories and the mission of environmental sustainability are two of the goals built into the primary goals. The more specific service provided to targeted audiences may allow for delivering more diverse and alternative viewpoints in news content. Therefore, this study proposed the following:

H2a: News published by non-profit organizations will be more likely to present minority viewpoints than news published by commercial organizations.

H2b: News published on news sites that accept user-submitted stories will be more likely to include minority viewpoints than news published on news sites that do not accept user-submitted stories.

H2c: News published by environmental sites will be more likely to present minority viewpoints than news published by news sites with different missions.

Social institutions. At the level of social institutions, factors influencing media content are exerted outside the media organizations. The proximity of a news organization to an environmental event may influence the types of viewpoints presented in the news. Media outlets serving a specific community may present viewpoints different from national or prestige media. Therefore, this study proposed the following:

H3: Environmental news published by regional media will be more likely to present minority viewpoints than news published by national news outlets.

By considering that citizen contributors are less likely to be constrained by media routines and organizational factors, this study further examines whether media content authored by citizens will be predicted by factors that differ from the factors predicting professional journalists' work. Therefore, this study addresses the following two research questions:

RQ2a: Among all citizen contributors' work, what factors predict their use of minority viewpoints in the environmental news?

RQ2b: Among all professional journalists' work, what factors predict their use of minority viewpoints in the environmental news?

CHAPTER 2

METHODS

This study used quantitative content analysis to test proposed hypotheses and answer research questions.

Sample

Case study. Previously considered untenable, the exploration of the Arctic for oil became a more feasible plan around 2007 due to recent technological developments, melting ice caps in the Arctic Ocean, and relatively high oil prices. The Royal Dutch Shell Company, commonly known as Shell, bided \$2.1 million for offshore drilling leases in the Chukchi Sea back in 2008. In 2012, Shell was granted permission to drill, and its drill ships left Seattle for Alaska. Between 2012 and 2015, Shell halted its Arctic exploration for various reasons, including a failure to pass oil spill response tests, extreme weather conditions in the Arctic waters, the violation of air permits, legal challenges of oil and gas lease sale, and safety problems of its drill equipment. In January 2015, Obama administration announced the five-year plan for offshore drilling, including the approval to Shell's Arctic oil drill, and few months later Shell's oil drilling rigs left Seattle for Arctic exploration. In September 2015, however, Shell announced it was abandoning the plan due to disappointing quantities of oil and gas in the area.

This study focused on news coverage in English during the 2012 to 2015 time period regarding oil drilling offshore of Alaska. The commonly-used phrase in news coverage was "Arctic oil drilling" so that phrase is used throughout this study. The main actors involved in the media coverage included public officials and organizations (for example, Obama Administration and Department of Interior), environmental organizations (for example, Greenpeace, Oceana and Earthjustice), the oil company Royal Dutch Shell and citizens of Alaska and Washington State.

This news event was chosen to test the hypotheses in this study for several reasons. First, the discussion of the topic ranged from local impacts to global concerns. People living along the northern coast of Alaska are heavily dependent on marine mammals for food. Polluted Arctic sea waters could devastate their culture and income. Also, residents in Seattle, where Shell's drilling rigs were stationed, debated whether the city should be part of the Arctic oil drilling plan. Globally, the drilling may potentially cause extensive damage to marine species, encourage the use of greenhouse gases, and produce uncontrollable oil spills. Second, this topic was involved in a wide range of viewpoints. Critiques addressed ecological, legal, economic, moral, and technical aspects of Arctic drilling. Finally, this event evolved from the very beginning of Shell's Arctic exploration to Shell's decision to abandon the drilling plan. The news attention cycle (Trumbo, 1996) was complete, and the collected sample had the potential to incorporate all types of sources and viewpoints in all stages of the issue.

The selected topic shares some features of many environmental issues. First, the NIMBY effect is found in the selected topic. NIMBY refers to "the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood" (Van der Horst, 2007, p. 2706). Shell's drilling activities may pollute Arctic waters, and thus influence culture and subsistence use by Inupiat people. The tribal government of Point Hope was backed by several environmental groups to fight offshore drilling plans. Second, the selected topic represents a common environmental issue facing the 21st century—because of the depletion of conventional fossil fuels, the unconventional fossil fuels (such as oil sands and shale through fracturing) and conventional high-risk technologies to drill deep water offshore oil will most likely to pollute the planet in the process of extraction and through the emission as greenhouse gases.

However, the selected topic is also unique. The beginning year of the Shell's Arctic exploration was only two years after the 2010 Deepwater Horizon Oil Spill (also known as the BP Oil Spill). Due to the fresh memory of the environmental disastrous event, the Arctic oil drilling is an environmentally sensitive issue in the United States and may induce more opposing views on the activities than other activities related to the extraction of unconventional oil. In addition, the Alaska Arctic is a pristine natural environment, and opposing viewpoints taken to protect the area may be much more common than other environmental issues because any environmentally related risks are more unacceptable in this area. It was thus expected that this topic would generate multiple viewpoints from both professional and citizen journalists, and present more opposing viewpoints than positive views in the sample.

Sampling frame. This study focuses on citizens' contribution to news content and it is important to incorporate citizen blogs and citizen journalism sites in the sample. The population of the study is all English text news articles and opinion pieces about Shell's Arctic oil drilling in Alaska, published between January 1, 2012, and December 31, 2015. Since the population was unknown, the goal of the sampling strategy was to incorporate as many related articles as possible. Because online news aggregators include more extensive news coverage of events than the LexisNexis database (Cunningham, 2005), and are more capable of providing news content retrieved from citizen sites, this study used the online news aggregator *Google News* as the sampling frame.² Also, a list of citizen and online startup sites was used as a supplement to the *Google News* database (see Appendix A).

² The author had done an initial search from the LexisNexis database and the second largest search engine, Bing. *Google News* provided more news articles from *The New York Times* than the LexisNexis database. In addition, *Google News* offered more news content from citizen journalist sites or blogs than *Bing News*, shown through a comparison of the same keyword search results about citizen sites from both news sites.

Google News was selected as the main database to search the topic of Arctic oil drilling for two reasons. First, neither the databases with the citizen media sites nor the online news startups had been updated regularly. The Knight Network database had not been updated since 2010, and the most recently updated site in the Columbia database was created in May 2013. A comparison of two aggregator sites between 2010 and 2013 showed that the Columbia database incorporated 131 more sites than the Knight Network database—more than a 10% difference. A review of the majority of the sites listed on these databases found that at least 143 sites (10.24%) no longer even exist on the Internet. Many other sites had not been updated for several months to years.

Second, this study focuses on a specific environmental issue, Arctic oil drilling. The majority of the citizen or news startup sites did not report on environmental issues.³ In order to find relevant stories, 44 regional and 23 national environmental sites were identified by searching for the site descriptions on the Knight and Columbia list or on the Internet (if the descriptions were missing on the list).⁴ Based on the comparison between *Google News* results and the list of environmental sites, this study argues that sampling from environmental sites on the list would exclude many stories published on general-interest citizen sites. In the trial sampling, 12 out of 25 articles were published by blogs or online-only sites that had no descriptions or news sections specifically for environmental-related issues. In other words, stories about Arctic oil drilling were not necessarily published solely by environmental-related sites.

³ Another trial sampling was completed using the Knight and Columbia list. Among 10 news sites sampled from the list, only one news site had reported on the chosen topic. Sampling the entire list was not the best way to find stories about Arctic oil drilling.

⁴ The site was identified as an environmental-related site if its description contained the word “environment,” “conservation,” “energy,” “wildlife,” or other related terms. Also, if the site had a news section for environment or energy news, the site was identified as an environmental-related site.

Since the Knight and Columbia databases were not constantly renewed and were not the best sampling approach to locate articles about Arctic oil drilling, *Google News* was used as the main database to search for relevant stories. In order to check whether the *Google News* search incorporated news sites listed in the Knight and Columbia databases, the same sets of keywords used for *Google News* search were adopted to search for stories in the Knight and Columbia databases.

Similar strategies were applied to the sampling frame of professional news sites, including professional newspapers, magazines, television, and radio stations. Stories about Arctic oil drilling were not reported by all professional news media. Therefore, using keywords to search in a database is a better approach to sample articles about Arctic oil drilling. *Google News* contained at least 6,608 online English news sites in its database, compared to 3,273 English news sources in the LexisNexis database. In an initial trial sampling of related news in 2012, the search of *Google News* resulted in 142 related articles, compared to 74 articles in the LexisNexis database.

Keyword search. In order to sample relevant stories as completely as possible by using keyword searches, this study conducted a formal test of recall to measure the ability of a string of keywords to retrieve related stories.

Identifying relevant stories. In order to measure whether a set of keywords was able to retrieve the most relevant stories, this study first defined “relevant stories of Shell’s Arctic oil drilling” and then conducted an inter-coder reliability test between two coders. The operational definition of the relevant stories of Shell’s Arctic oil drilling included several rules regarding the actors, entities, regions, relevant events, and position of the keywords in stories (see Appendix B). The *Krippendorff’s alpha* was 0.963 by testing on 85 randomly selected stories through the

open search term “Arctic oil drilling” in *Google News* search. According to Riffe, Lacy, and Fico’s (2005) instruction that indicated the required number of content units for reliability test (pp. 146–147), the test results suggested a good level of consistency to recognize relevant stories.

Measuring recall. The initial open search term was “Arctic oil drilling” without setting “exact word search” in *Google News*. The search results of the open search term showed the most stories that were roughly matched with the term. To avoid variation of search results by using roughly matched search, this study set up a string of exact search terms by observing the results of the open search term. The initial exact keywords included “Arctic drill,” “Arctic drilling,” “Arctic offshore drilling,” “Arctic offshore oil drilling,” “Arctic oil,” “drilling for oil and gas in the Arctic,” “drilling for oil in the Arctic,” “drill in Arctic,” “drill in the Arctic,” “oil exploration in the Arctic,” “Seattle Kayaktivists Protest,” “Shell icebreaker,” and “Shell Oil icebreaker.”

Then, stories from five randomly selected weeks were compared between the open search results and the results using exact-word combinations.⁵ The comparison was repeated for each of the selected weeks. The exact-word terms were added after each comparison until more than 90% of the stories were matched between the two results. The five sets of comparisons added another 38 exact-word terms into the search (see Appendix C).

To measure recall, relevant stories from an additional randomly selected nine weeks were compared between the open search term and the 51 exact-word terms. The comparison indicated

⁵ The randomly selected weeks for the initial comparison between the open search term and the exact-word terms included February 14th to 20th, 2012; February 23rd to 29th, 2012; December 11th to 17th, 2012; June 24th to 30th, 2013; and January 25th to 31st, 2015.

that, among 294 relevant stories,⁶ 270 stories were captured by the 51 exact-word terms. The estimated recall of relevant stories by using 51 exact-word combinations was 91.84%.

Sampling procedure. This study randomly selected 47 weeks⁷ of 708 relevant stories e The sampling procedure included several steps. First, one of four years between 2012 and 2015 was randomly selected. Second, a month from the selected year was randomly sampled. Third, a date out of the sampled month was randomly selected as the first date of seven consecutive days. If the selected date had already been sampled, the procedure was redone from the first step. Fourth, the 51 exact keywords were used to search all relevant stories of the seven consecutive days in *Google News*. Fifth, the trained coders manually picked stories relevant to Shell's Arctic oil drilling during the week. The five steps were repeated until 708 stories were selected.

In sum, the first part of the sampling process was performed by randomly selecting weeks within the sampling years. Then, all relevant stories published at the selected weeks were collected into the sample. In total, 47 weeks were randomly selected, containing a total of 708 relevant stories.

After the *Google News* search, the 51 exact keywords were also applied to search relevant stories in the environmental-related sites in the Knight and Columbia databases (see Appendix A). The search only added another three stories into the sample from the High Country News website (hcn.org), a non-profit magazine serving the Western United States on the issue of energy, wildlife, and climate. The total number of stories in the sample was then 711.

⁶ According to Stryker et al. (2006), at least 283 relevant stories were required to measure recall at 90% with a 5% confidence interval.

⁷ The number of 710 stories was chosen as the sample size because this number was manageable for data collection, and the predicted minimum number of events per variable (EPV) was high enough to avoid bias in the logistic regression model. After sampling on 47-week of stories, the number of stories was very close to 710. Therefore, the sampling procedure stopped after 47-week of stories were sampled.

Initial observation of the sample. The sample contained all relevant stories from 47 randomly selected weeks. Major events reported during the randomly selected weeks included several protests initiated by Greenpeace, controversies over Shell's Arctic drilling fleet stationed at the Port of Seattle, Shell's violation of air permits during drilling, the loss of Shell's Kulluk drilling rig in Alaska, the announcement of the Obama Administration's five-year plan for offshore drilling, and Shell's abandoning Arctic drilling in Alaska. A list of the selected weeks, the number of stories for each week, and the major events of the selected dates are presented in Table 1.

From 2012 to 2015, the average number of stories in a week was 10.5 (2012), 9.6 (2013), 7.4 (2014), and 32.2 (2015). The total number of stories sampled from 2012 to 2015, by year, were 126, 125, 74, and 386, respectively. The issue drew the most media attention in 2015 when Shell's Arctic fleet was stationed in Seattle and when the Obama Administration released the five-year offshore drilling plan. The major relevant events in the news occurred mainly in the United States, while several protests occurred outside the country.

Through depicting the major events and numbers of stories, Table 1 shows that news media were more likely to report on the issue when (a) Shell performed some drilling activities; (b) Environmental groups initiated campaigns or protests; and (c) the government, especially the Obama Administration, announced public policies or decisions on relevant issues. Among all events, the official announcement by the government was more likely to trigger more news coverage or opinion reactions than other events. This was demonstrated by the largest number of articles collected from 2015, which was the only year in the sample that the Obama Administration announced important policies on the five-year plan of the offshore oil drilling. This also implied that the viewpoints measured in this study were mainly from the discussion

Table 1. Sampled Stories by Dates, Number of Stories and Major Events.**Year of 2012**

Dates	#⁸	Major Events
01/9~01/15	0	
02/15~02/21	4	
02/23~02/29	26	Lucy Lawless was arrested in drilling protest.
03/01~03/07	5	
03/26~04/01	6	
04/17~04/23	5	
05/24~05/30	7	
06/26~07/02	16	▪ Shell's drill ships left Seattle for Alaska. ▪ International Summit on Arctic drilling in Norway. ▪ Shell was granted permission to drill.
07/16~07/22	36	▪ An environmental campaign targeted Shell patrol stations in Edenborough and London. ▪ An announcement that the Coast Guard would launch a response to increased Arctic shipping. ▪ Shell was mocked by Greenpeace in Arctic online campaign.
09/08~09/14	20	▪ MIT proposed a scientific method for cleaning up oil spill. ▪ Shell begun preparatory drilling in the Arctic.
11/11~11/17	1	
12/15~12/21	0	
Total	126	

Year of 2013

Dates	#	Major Events
01/06~01/12	38	▪ Shell violated air permits for Arctic ships.
02/22~02/28	21	▪ Shell's lost drilling rig Kulluk was towed to Shelter in Alaska.
03/03~03/09	3	Shell halted 2013 drilling plan.
04/21~04/27	5	
06/16~06/22	3	
06/24~06/30	5	
08/25~08/31	19	▪ Greenpeace created a giant polar bear for "Save the Arctic" campaign. ▪ A Greenpeace protestor appeared in court.
09/09~09/15	10	▪ "Save the Arctic" logo was shown in Belgian Grand Prix race.
10/03~10/09	2	Greenpeace's giant bear in London.
10/11~10/17	1	
11/06~11/12	6	
12/10~12/16	12	Greenpeace released a video campaign that delivered Santa Claus' message to save the Arctic.
12/19~12/25	0	
Total	125	

⁸ Numbers of the stories in the week.

Table 1 (cont'd)

Year of 2014		
Dates	#	Major Events
01/18~01/24	10	The court of appeals denied offshore oil lease sale in Arctic.
02/02~02/08	6	
03/09~03/15	7	
04/08~04/14	7	
05/05~05/11	4	
06/19~06/25	1	
07/29~08/04	15	
09/21~09/27	8	
10/28~11/03	9	
11/10~11/16	7	
Total	74	
Year of 2015		
Dates	#	Major Events
1/25~1/31	55	- President Obama planned to propose protecting Arctic Refuge from oil drilling. - Obama administration announced its five-year plan for offshore drilling.
2/28~3/6	26	
		- Environmental groups sued the Port of Seattle to host Shell's Arctic drilling fleet. - Obama administration decided on Shell's request for extra time in Arctic waters.
3/7~3/13	19	
4/15~4/21	22	- The discussion of hosting Shell's Arctic drilling fleet in Port of Seattle continued. - First vessel of Shell's Arctic fleet arrived at Terminal 5 in Seattle. - Shell's revised drilling plan in the Arctic was under review. - Seattle kayaktivists protested against hosting Shell's Arctic fleet.
5/24~5/30	79	- Presidential candidates' positions on Arctic oil drilling. - The discussion of Seattle kayaktivists' protesting against Shell's Arctic drilling fleet continued. - A report released by the National Transportation Safety Board asserted Shell's responsibility for disastrous Arctic exploration in 2012. - A protester suspended from the anchor chain of Shell's support ship. - Discussion of Obama administration who gave conditional approval to Shell's Arctic drilling plan. - President Obama toured the National Hurricane Center in Miami and talked about climate change. - Former Shell worker cited unsafe conditions on oil ships. - LEGO cut ties with Shell. - Discussion of Shell's Arctic drilling plan in the summer.
6/18~6/24	30	- The EPA proposed cutting greenhouse gas emissions from the oil and gas sector. - Hillary Clinton came out against Arctic drilling. - President Obama visited Alaska's Arctic.
8/14~8/20	59	- Shell abandoned Arctic oil drilling. - The Department of Interior announced the cancellation of two Arctic offshore lease sales. - Shell abandoned Canadian oil sand projects.
8/30~9/5	6	
9/22~9/28	46	
10/22~10/28	22	
11/29~12/5	8	
12/6~12/12	14	
Total	386	

about energy policy among the oil company, the advocacy groups, and the policymakers and officials.

Sampling units. News stories, commentaries, or blog articles about Arctic oil drilling in the *Google News* database and the environmental-related news sites in the Knight and Columbia databases (see Appendix A) published during the randomly selected weeks from 2012 to 2015.

Coding units.

Coding unit 1. For content-related variables: one or more statements that addressed a viewpoint with a position and a rationale on Arctic oil drilling in a news story.

Coding unit 2. For website-related variables: one news story or opinion piece published on a news site.

Context units. A paragraph that contains the coding definition of issue position and rationale.

Analysis units. A viewpoint with a position and rationale on the Arctic oil drilling.

Measuring Viewpoint Diversity

Although measuring media viewpoint diversity has been a central topic in communication research, problems still exist in providing variability of the measurement and validity of the construction (Ho & Quinn, 2009). The majority of previous studies have focused on the degrees to which media has been slanted toward a political party/ideology. The dichotomous spectrum on viewpoint diversity simplified the decision-making process into the contradiction between two political parties/ideologies and, thus, lost the variability of different viewpoints beyond party preferences. This type of measure is limited to news about political issues and difficult to replicate in other public issues, such as environmental issues.

This study aims to examine a variety of viewpoints regarding the topic of Shell's Arctic drilling from 2012 to 2015. An issue position can be expressed through claims by identifying arguments or judgments about the action, the key players, other actors' claims, or the consequences of Arctic oil drilling.⁹ A position can also be expressed through actions taken by the key players, such as commencing an exploratory drilling, a lawsuit against relevant entities, or a protest. A rationale of an issue position needs interpretations, reasons, or evidence to support the position.

To operationalize viewpoint diversity, this study examined minority viewpoints. A story that presents minority views was regarded as one that increased viewpoint diversity. The following paragraphs provide details of computing minority viewpoints.

Issue position. Issue position was measured by coding three types of claims or actions: positive=1 (supporting continuing the drilling), opposing=2 (against current activities on the drilling), neutral=3 (no preference on the issue). Ambiguous or no position was not coded. The maximum number of positions coded in each story was 10. In the 711 stories, a total of 2,884 issue positions were identified, including 1,370 positive positions (47.50%), 1,503 opposing positions (52.12%), and 11 neutral positions (0.38%). Almost all stories (96.6%) had at least one position presented. The average number of positions in each story was 4.06 (*S.D.*=2.69).

Rationales.

Six orders of worth. The measurement of rationales adopted Boltanski and Thevenot's (2006) modes of justification to categorize different viewpoints. Based on empirical analysis between 1968 and the 1990s, Boltanski and Thevenot viewed the negotiations and cooperation among different social groups toward a common good as the result of the relationship between

⁹ A detailed description of identifying a positional viewpoint can be seen in Appendix 4.

different cognitive forms and the material world (Boltanski & Thevenot, 2006; Guilhot, 2000; Thévenot, 2001). In simpler terms, citizens experienced different benefits or shortcomings from the world, and the experiences were systematized into different “orders of worth,” which were used when citizens were engaged in arguments about public policies. Boltanski and Thevenot (2006) provided a generalized principle to categorize individual viewpoints into a more easily quantifiable and replicable measure.

As depicted in Boltanski and Thévenot’s (1999) paper that summarized their studies published in French, the six orders of worth framework was developed through both empirical studies and text analysis. The researchers first gathered data recording the process of disputation among graduate students. The data provided a large set of arguments containing justifications used in daily life. Then, the authors reviewed literature from the field of political philosophy to systemize and classify the observed disputes. Once several philosophical constructions of a political nature were identified and matched to observed arguments, the principles of viewpoints were developed as the six orders of worth.

According to Boltanski and Thevenot (2006), the justification of a personal viewpoint toward a public policy can be generalized into (a) market performance, (b) technical efficiency, (c) civic equality, (d) inspirational expression, (e) moral principles, (f) popularity, and (g) ecological sustainability (Baden & Springer, 2014; Thevenot, Moody, & Lafaye, 2000). The seventh justification of ecological sustainability was added by Thevenot et al. (2000). In each category, defined below, a viewpoint can be expressed as a positive claim, an opposing position, a neutral view, or an ambiguous position.

Market performance. A viewpoint in this category makes its justification based on the price or economic value of an action or entity. An example of this type of justification regarding

Arctic oil drilling can be expressed as, “The expensive arctic oil drilling is not quite favorable with low oil prices,” or, “The arctic oil drilling is quite favorable with relatively higher oil prices.”

Technical efficiency. A decision is worthy or right because it is necessary and because it works. Examples of viewpoints in this category can be illustrated as, “Arctic oil drilling is not necessary because technological development allows us to move toward renewable energy,” or, “The Arctic drilling equipment was not safe.”

Civic equality. A viewpoint is involved in the legal process, equal access, and protection of civil rights. For example, “Shell oil rigs cannot use Terminal 5 without a new permit under the State Environmental Policy Act.”

Inspirational expression. A viewpoint displays passion, emotion, or creativity toward an action or entity. For example, “The Arctic oil drilling could destroy the Inupiat’s culture and age-old traditions.”

Moral principles. The justification is based on socially accepted or bounded principles, social trust, and responsibilities. An example could be, “The oil companies cannot trigger global warming and melting Arctic and then go for drilling in this area.”

Popularity. The worth of a cause can be determined by public concern. It is “what the people want” that makes the justification. An example of a viewpoint in this category could be, “The majority of Americans (do not) support the Arctic oil drilling.”

Ecological sustainability. Actions or decisions are worthy because they are in harmony with nature. The justification of a viewpoint is made by considering environmental consequences, and protecting environmental resources and the attachments to nature. For example, “Arctic oil drilling imposes extensive damages to the environment due to the potential

blowout or large oil spills,” “The Arctic oil drilling should be stopped to avoid climate chaos,” or “Alaska oil is the most environmentally friendly oil compared to oil derived from fracking.”

Empirical research adopting seven justifications. Although the order of worth framework was published in 1991, it was not adopted in empirical studies on media content until recent years. Even though few studies were found, the adoption of the orders of worth in studying media content ranged from simple coding that searched the presence or absence of one order (Ten Eyck, 2014) to a very complex coding scheme in which seven justifications were coded under different levels of units (one story vs. four frame elements) with a distinction between logic of action and evaluation (Baden & Springer, 2014). To avoid lack of variety by searching only one justification and losing reliability by examining every justification at multiple levels,¹⁰ this study adopted seven justifications at a consistent level—categorizing each viewpoint into one of the seven justifications. In a study (Gladarev & Lonkila, 2013) using public justification analysis on news coverage of new building projects in a public park, the seven justifications were used to categorize every instance of justification. The results showed that about 93% of the stories contained at least one of the justifications referring to the issue. The results indicated all but one justification (inspirational expression) were coded in the case of Russia, and all justifications were presented through the reporting in Finland.

Measuring rationales. In the sample, although the numbers of positive and opposing positions were nearly equal, only a quarter ($n=356$, 25.99%) of positive positions was presented with at least one rationale.¹¹ On the other hand, more than half ($n=913$, 60.75%) of opposing

¹⁰ Baden and Springer’s (2014) content analysis on news coverage and news users’ comments only reached an average of 0.78 (Holsti’s *M*) at the test of inter-coder reliability. The *M*s ranged from 0.6 to 1.0, and one variable failed to achieve 0.6.

¹¹ One of the reasons that positive positions were more likely to be presented independently without giving rationales was that Shell’s drilling activities were coded as a positive position. In this case, quotes from Shell may

positions was reported with at least one rationale. The total number of positions reported with given rationales was 1,278. Among 711 stories, 74.5% contained at least one or more rationales. The average number of rationales in each story was 2.82 (*S.D.*=2.96).

The large difference between positive and opposing rationales can be attributed to two reasons. First, the positive sources didn't give rationales. This study coded all Shell's Arctic exploratory activities as positive positions—the actions represented that Shell favored Arctic drilling. The decision on coding all Shell's drilling activities as positive positions increased the frequency of positive positions without rationale. For example, a story reporting on protests against Arctic oil drilling was usually accompanied with the code “positive position” taken by Shell simply because Shell's activities were mentioned. A lawsuit against Shell's drilling was coded as “opposing position due to civic equality,”¹² while a “positive position without rationale” was coded for Shell because Shell's activities were involved in the story without giving any reasons.

Second, in order to have rationales coded consistently among different coders, the rationales were strictly defined as direct reasons favoring or against Arctic oil drilling. In some cases, Shell emphasized its sound oil-spill response plan, environmental impact statement, or any other technically related exploration plan to respond to opposing voices, especially when environmentalists questioned the potential of an oil spill. These responses were not treated as rationales of Arctic oil drilling because they were requirements in order to perform the activities instead of reasons triggering Shell's Arctic oil drilling. This decision in coding protocol resulted

only contain a description of drilling activities, while other sources took positions on the events. In the sample, at least 321 positive positions taken by Shell were not presented with any rationales.

¹² If the story explained why Shell was against the law, other codes might be applied (such as coding “ecological sustainability” as a rationale when the lawsuit was about Shell's violation of environmental laws).

in an increased number of positive positions without rationales. In total, at least 321 positive positions taken by Shell were coded as no rationale.

This study generated 20 different viewpoints ($N=2,001$, see Table 2). The neutral position adopting popularity as the rationale was not found in the sample. Among seven justifications, ecological sustainability ($n=546$, 27.29%) and technical efficiency ($n=432$, 21.59%) were two of the most frequently used justifications to oppose the drilling plan. Those who favored Arctic oil drilling tended to justify their positions with market performance ($n=291$, 14.54%) and technical efficiency ($n=227$, 11.34%). All other rationales were coded as minority viewpoints ($n=505$, 25.24%)—defined as the less frequently adopted rationales for a specific position. The detailed descriptions and examples of 20 rationales are found in Table 3.

Measuring Independent Variables

Media routines.

Workforce. This variable was coded into (a) 1=professional journalists; (b) 2=citizen writers/bloggers; (c) 3=wire services or all other syndicated news service; and (d) 4=Can't tell. Professional journalists were those who were staff writers, editors, freelance reporters, former journalists, and journalism faculty or students. Citizen contributors were those who were not professional journalists and had a job title that was not a journalist, such as a professor, a staff in an NGO, and so on. The detailed procedure of identifying an author's job title can be found in Appendix D, Coding Protocol: News Content. If a news story did not give credit to its author or any other sources, the authorship is coded as "uncertain." Among 711 stories, the majority was authored by professional journalists ($n=457$, 64.4%); fewer stories were authored by citizen

Table 2. Categories of Viewpoints by Frequency and Percentages (N=2,001).

	Justifications	Positions	Frequency	Percentages (%)
Frequent Viewpoints	Ecological Sustainability	Opposing	546	27.29
	Technical Efficiency	Opposing	432	21.59
	Market Performance	Positive	291	14.54
	Technical Efficiency	Positive	227	11.34
Minority Viewpoints	Civic Equality	Opposing	144	7.20
	Market Performance	Opposing	134	6.70
	Inspirational Expression	Opposing	78	3.90
	Moral Principle	Opposing	59	2.95
	Popularity	Opposing	38	1.90
	Civic Equality	Positive	11	0.55
	Ecological Sustainability	Positive	8	0.40
	Market Performance	Neutral	7	0.35
	Moral Principle	Positive	7	0.35
	Inspirational Expression	Positive	4	0.20
	Technical Efficiency	Neutral	4	0.20
	Ecological Sustainability	Neutral	3	0.15
	Inspirational Expression	Neutral	3	0.15
	Civic Equality	Neutral	2	0.10
	Moral Principle	Neutral	2	0.10
	Popularity	Positive	1	0.05
Total			2,001	100

journalists ($n=109$, 15.4%) or adopted from wire services ($n=100$, 14.1%); and a small number ($n=44$, 6.2%) of stories did not provide authorship information.

Media type. This variable included online-only news sites/blogs (coded as 1) and all other media types (coded as 0), including print, broadcast, and all other media services that distribute information through a medium/media beyond the Internet. All 711 stories were published by 293 different news sites, and 121 out of 293 (41.30%) sites were online-only news sites, including 286 stories (40.23%).

Table 3. Rationales with Major Points and Examples.

	Justifications	Positions	Major Concerns	Examples
Frequent Viewpoints	Ecological Sustainability	Opposing	• Oil spill • Climate change • Marine mammals • Air pollution	“...oil companies are trying to drill in the Arctic around him and that the oil, when it is used, ‘will make the melting of the Arctic all the quicker’” (S10 _ 20131210 _ nationalreview_Greenpeace's Santa). “A plan to allow Royal Dutch Shell PLC to use Seattle's waterfront as a homeport for its Arctic drilling fleet is drawing opposition from environmental groups that say it's not consistent with the region's environmental goals” (S107_20150128_foxbusiness_Plan to). “Cleaning up an oil spill in that environment would be far, far more difficult than in the Gulf of Mexico, and a spill’s effects would be more severe and long lasting in a cold-water environment than in warm waters” (S12_20130626_csmonitor_Global warming).
	Technical Efficiency	Opposing	• Safety issue • Responding equipment to clean up oil spill • Weather conditions	“...shortcomings in the design of a plan with an insufficient margin of safety allowed the Accident to take place” (S121_20150528_blog.seattlepi_NTSB blames). “A group of 18 mostly Democratic U.S. senators on Friday urged the Obama administration to stop Shell's preparations for oil exploration in the Arctic, saying the region has a severely limited capacity to respond to accidents” (S146_20150524_maritime-executive_18 US).
	Market Performance	Positive	• Creating jobs • Alaska’s economy • Energy economy • Energy security	“...since most U.S. refineries are currently operating at maximum capacity, additional crude production would likely spur investment in new plants” (S1 _ 20120215 _ eeneews.net_Critics challenge). “It’s a one-two-three kick to the gut of Alaska’s economy” (S103_20150129_outsideonline_Shell to).
	Technical Efficiency	Positive	• No alternative energy to replace fossil fuels • Melting ice makes drilling easier.	“The bureau approved the permit to drill below the ocean floor after the oil giant brought in a required piece of equipment to stop a possible well blowout” (S210 _ 20150819_foxnews_Clinton hit) “...he says consumers will still need fossil fuels during a transition to other energy sources, and he would rather rely on oil and gas extracted in the U.S. under federal regulations than from foreign sources” (S160 _ 20150524 _ chicagotribune_Protester leaves).

Table 3 (cont'd)

	Justifications	Positions	Major Concerns	Examples
Minority Viewpoints	Civic Equality	Opposing	Against the law	““We want the port to reconsider and follow the law. If they don't, we'll have to seriously consider going to court” (S107_20150128_foxbusiness_Plan to).
	Market Performance	Opposing	- Disappointing amount of oil - Low oil price	“The Arctic program is costly at any time, but it may be tougher to justify now that crude prices have sunk to a six-year low, depriving oil companies of revenue to reinvest in big ventures” (S102 _ 20150129 _ fuelfix_Shell planning).
	Inspirational Expression	Opposing	- Subsistence use by Alaska Natives - Arctic is a treasure.	“The Obama administration is placing parts of the Beaufort and Chukchi seas off-limits from consideration for future oil and gas leasing, citing the need to protect areas critical for subsistence use by Alaska Natives” (S26_20150127_ktva_Obama places).
	Moral Principle	Opposing	Social responsibility	“I will not allow Big Oil to externalize the moral shame of its attack on the Earth” (S136_20150526_crosscut_When it).
	Popularity	Opposing	Lack of public input	“But environmentalists say there was little environmental review or time for public input, and they reject the idea of Seattle being tied to Arctic offshore oil exploration” (S107_20150128_foxbusiness_Plan to).
	Civic Equality	Positive	Permitting drilling by law	“On Thursday House Republicans passed a bill to expand offshore drilling The tumult prompted the Interior Department to announce on Friday expanded oil exploration in the Arctic” (S4 _ 20120221_obrag.org_The gas).
	Ecological Sustainability	Positive		“I would rather us -- with all the safeguards and standards that we have -- be producing our oil and gas, rather than importing it potentially purchased from places that have much lower environmental standards than we do” (S49_20150529_adn_Sen. Giessel).
	Market Performance	Neutral		
	Moral Principle	Positive		“We should not be doing symbolic acts [protesting the Arctic oil drilling] that have real-life costs. For me, this is almost a social justice issue” (S20_20150128_blog.seattlepi_Shell's Arctic).
	Inspirational Expression	Positive	Patriotic	“the United States should facilitate Arctic offshore exploration now to be positioned to provide global leadership and influence in the Arctic”
	Technical Efficiency	Neutral		
	Ecological Sustainability	Neutral		
	Inspirational Expression	Neutral		
	Civic Equality	Neutral		
	Moral Principle	Neutral		
	Popularity	Positive		“Many Arctic peoples and governments agree with that judgment. They support the opportunity to explore for oil and gas in their territories” (S65_20150902_news.sky_Emma Thompson).

Journalistic formats. This variable contained two values (0=news story; 1=opinion pieces). Coders determined the formats by following five sequential steps:

1. Check the URL to see whether the word “news” or “commentary” was embedded in the web address of the article.
2. Browse the page to see whether any information was provided at the top of the article (such as News, Column, Letters, Voices, Opinion, etc.).
3. Check the date of the event. Events older than three days were coded as an opinion piece.
4. Determine whether the event is discussed in first, second, or third person. The use of the first or second person was coded as an opinion piece.
5. Check whether the author’s personal comments were presented.

Additional details of the operational definition of “journalistic formats” are found in Appendix E. Among the 711 stories, the majority (71.45%) was coded as 0=news story ($n=508$), while only about one-fourth (28.55%) of the sample was coded as 1=opinion pieces ($n=203$).

Information source. News sources are actors or suppliers that are passively observed by or actively provide information to journalists for news reporting (Gans, 1979; Shoemaker & Reese, 1991). Sources include interviewees, written materials (i.e., organizational reports) offered to journalists, events (speeches or government hearings) observed by journalists, and some other routine channels, such as news releases and news conferences (Berkowitz & Beach, 1993; Shoemaker & Reese, 1991). This study distinguished grassroots sources (coded as 1) from other types of sources (coded as 0).

The grassroots sources included individuals (protesters and citizens), small businesses (local retailers or farmers), and advocacy groups (coded as 1, other sources=0). In the coding

protocol, the information source was coded into more than two categories (see Appendix D), for two reasons. Since each category contains multiple types of sources, giving coders more details to distinguish grassroots sources from others may minimize the confusion of the term “grassroots.” Also, since the inter-coder reliability achieved at the level of multiple types of sources, the data can be potentially used in other papers beyond this study.

Among 711 stories, a total of 2,884 sources took positions on the selected issue. In total, other sources ($n=1,825$, 63.28%) were cited more frequently than grassroots sources ($n=1,059$, 36.72%). Corporations ($n=636$, 22.05%) and political sources ($n=605$, 20.98%) were two of the most frequently cited sources taking positive position on Arctic oil drilling. Grassroots sources ($n=966$, 33.50%) tended to oppose Arctic drilling. Among all grassroots sources, environmental groups ($n=610$, 21.15%) were cited most frequently in opposing positions (see Table 4).

Table 4. Frequencies and Percentages of Information Sources by Issue Positions ($N=2,884$).

	Positive		Opposing		Neutral		Total	
	Counts	%	Counts	%	Counts	%	Counts	%
Science	17	0.59	59	2.05	2	0.07	78	2.70
Corporations	636	22.05	107	3.71	1	0.03	744	25.80
Politics	605	20.98	311	10.78	3	0.10	919	31.87
Media	10	0.35	14	0.49	1	0.03	25	0.87
Protestor	0	0	185	6.41	0	0	185	6.41
Small Business	65	0.10	9	0.31	0	0	74	2.57
Environmental Groups	0	0	611	21.19	1	0.03	612	21.22
Non-environmental groups	6	0.21	57	1.98	0	0	63	2.18
Citizens	21	0.73	104	3.61	0	0	125	4.33
Grassroots	92	3.16	966	33.50	1	0.03	1059	36.72
Others	10	0.35	47	1.63	2	0.07	59	2.05

Organizational factor.

Ownership. This variable was coded as 0=commercial and 1=not-for-profits. Among 293 news sites, only 54 sites (18.43%) were created by not-for-profit organizations. Only 130 out of 711 (18.28%) stories were produced by non-profit organizations.

USS site. In a news site, if the mission statement indicated (a) user-submitted stories as the source of its content; (b) invitation to news users to submit news stories; (c) a link or email address to submit news stories (not sources, opinions, or feedback); (d) it was a citizen blog, which was not contributed by a (former) professional journalist, it was coded as a USS site (coded as 1). Otherwise, the site was coded as 0. Among all 293 sampled news sites, about one-third (33.45%) indicated the service of user-submitted stories. Among all 711 stories, only 185 (26.02%) were published by USS sites.

Mission type. A news site or a news blog was coded as 1=environmental news site, if its mission statement or its slogan on the site contained environmental-related descriptions, such as wildlife, clean energy, conservation, environmental sustainability, and green living. Other sites were coded as 0=other sites. In the sample, few news sites were coded as environmental sites ($n=29$, 9.90%), and only 69 issue-related stories were published on environmental news sites ($n=69$, 9.70%).

Social institutions.

Community Focus. Stories published by regional media outlets in Alaska, Washington, and Oregon were coded as 1. All other stories were coded as 0. To identify the service area, one coder searched information on each sampled news site. Details of the coding procedure are found in Appendix E. Among 293 sampled websites, a total of 30 sites (10.24%) were coded as community-focused news sites, including 13 (4.44%) Alaska-based, two Oregon-based (0.68%),

and 15 Washington-based sites (5.12%) (see Table 5). In 711 stories, 63 (8.86%) were published by Alaska-based outlets, eight were Oregon-based (1.13%), and 104 (14.63%) were Washington-based.

Table 5. List of Sampled News Sites Serving the States of Alaska, Oregon, and Washington (N=30).

News Site	Name of the Outlet	State	n*
akaskapublic.org	Alaska Public Media	Alaska	6
alaskajournal.com	Alaska Journal of Commerce	Alaska	5
adn.com	Alaska Dispatch News	Alaska	33
juneauempire.com	Juneauempire.com	Alaska	3
kdlg.org	Public Radio for Alaska's Bristol Bay	Alaska	1
knom.org	knom Radio Mission	Alaska	2
ktoo.org	KTOO Public Media	Alaska	3
ktva.com	KTVA CBS 11 News	Alaska	1
peninsulaclarion.com	Peninsula Clarion	Alaska	2
petroleumnews.com	Petroleum News	Alaska	3
sewardcitynews.com	Seward City News	Alaska	1
sitnews.us	Sit News	Alaska	2
thebristolbaytimes.com	The Bristol Bay Times	Alaska	1
Total			63
dailyastorian.com	The Daily Astorian	Oregon	1
oregonlive.com	The Oregonian	Oregon	7
Total			8
blog.seattlepi.com	seattlepi.com	Washington	8
chinookobserver.com	Chinook Observer	Washington	1
crosscut.com	Crosscut.com	Washington	4
kitsapsun.com	Kitsap Sun	Washington	1
komonews.com	KOMO Radio	Washington	3
kplu.org	KPLU Public Radio	Washington	5
kuow.org	KUOW Public Radio	Washington	7
myballard.com	My Ballard	Washington	1
nwpr.org	Northwest Public Radio	Washington	2
peninsuladailynews.com	Peninsula Daily News	Washington	2
q13fox.com	Q13 Fox	Washington	3
seattletimes.com	The Seattle Times	Washington	9
seattleweekly.com	Seattle Weekly	Washington	1
thestranger.com	The Stranger	Washington	27
westseattleblog.com	West Seattle Blog	Washington	3
Total			104

* n= number of stories published on the site.

Inter-Coder Reliability

This study focuses on how different levels of citizen journalism supplement other news sites to increase the coverage of minority viewpoints. In other words, the representation of the skewed category containing minority rationales is meaningful and important in this study. However, the low prevalence in some categories may have caused a problem called “paradoxical behavior” when the inter-coder reliability test was performed (Cicchetti & Feinstein, 1990).

To resolve the problem, Gwet (2008) first explained the phenomenon in detail. A paradoxical behavior occurs when a low agreement coefficient is estimated with a high agreement among coders. For example, coder A and B coded the rationale “moral principle” with 95% agreement. Due to the low prevalence of the category, traditional coefficients—such as Scott’s π , Cohen’s k , and Krippendorff’s α —tended to estimate a low agreement coefficient even with a high percentage of agreement (Gwet, 2008). In the end, for Gwet, the π - and k - statistics determined the reliability by the trait prevalence instead of the extent to which coders made the same decisions.

Gwet (2008) argued that the reason π - and k - statistics underestimated inter-coder reliability was due to the ill-estimation of chance-agreement probability (i.e., coders’ agreement on a rating by chance). Gwet introduced the AC_1 coefficient, which provides a more reasonable agreement coefficient when rare categories are tested. To calculate the AC_1 coefficient, codes made by chance must be isolated from codes given with certainty. Unlike π - and k - statistics, the AC_1 coefficient does not treat all codes with high prevalence as random agreement. The estimation of random codes was made proportionately with observed agreement by chance. As a result, the AC_1 coefficient reduced the overestimation of random agreement.

Gwet (2008) also conducted a simulation test to compare biases among different coefficients. When the prevalence rate was set to 95%, the AC_1 coefficient demonstrated a small bias, ranging between -0.8% and -2.1%, even with a sample size as small as 20. Other coefficients (π - and k - statistics) showed a larger bias, ranging from -32% to -57.4%. Also, the variance estimates of 500 simulations indicated that the AC_1 coefficient had the smallest variance even with a small sample size ($n=20$).

In light of the nature of the current study and the resolution of paradoxical behavior offered by the AC_1 statistic, the inter-coder reliability test adopted the AC_1 coefficient to measure agreement among coders. AgreeStat (2015.5 Windows) was used on Windows 10 to calculate the coefficients.

The reliability test was performed at two stages, separately. First, a group of four coders were trained from March 7th to May 15th of 2016. The training was focused on five variables: workforce, journalistic formats, information source, issue positions, and rationales—which were all content-related variables. The average hours of training for each coder, including inter-coder reliability testing, were 65.38 hours. Training stories were selected by using the open search term “Arctic oil drilling” in *Google News* before and after the sampling years. For the reliability test, 66 stories¹³ were randomly selected from the sample and contained at least one of the values in each category. One coder was dropped due to lower agreement with others. Table 6 shows the agreement percentages and the agreement coefficients for each content-related variable. All variables, except journalistic formats, reached the 0.80 reliability standard¹⁴ at the first stage.

¹³ In Gwet’s (2008) variance estimates of AC_1 statistic, a sample size larger than 60 had similar variance estimates, ranging from 0.07% to 0.10%.

¹⁴ Krippendorff (2013) suggested researchers should only rely on variables with reliability coefficients above .8. As a rule of thumb, the coefficient of .9 and above is acceptable for all, and the coefficient of .8 is acceptable in most situations (Riffe et al., 2005).

Table 6. Inter-Coder Reliability Results of Content-Related Variables (N=66).

		Agreement Percentages (%)	Coefficients (Gwet's AC₁)
Workforce		85.54	0.83
Journalistic Formats		78.14	0.72
Information Source	Science	95.60	0.96
	Business	96.94	0.95
	Politics	96.94	0.95
	Media	100	1
	Protestors	92.86	0.92
	Small businesses	94.90	0.94
	Environmental groups	91.84	0.87
	Non-environmental groups	96.94	0.97
	Other individuals	96.94	0.97
Issue Positions	Positive	93.12	0.87
	Opposing	89.95	0.80
	Neutral	98.93	0.99
Rationales	Market	93.53	0.92
	Technical	87.56	0.81
	Civic	95.52	0.95
	Inspirational	97.02	0.97
	Moral	97.51	0.97
	Popularity	97.51	0.97
	Ecological	95.52	0.94

Because journalistic format failed to achieve the accepted reliability cut-off point, a second coding stage was undertaken to improve the reliability for the journalistic format variable. In the second stage, two coders were trained from May 15th to June 10th of 2016 to code journalistic formats and website-related variables—USS sites and mission types. The protocol of journalistic formats was revised at this stage (see Appendix E). The average hours of training for each coder, including inter-coder reliability testing, were 30 hours. Training websites were selected from the training stories of the first stage. For the reliability test, 85 stories and their websites were randomly selected from the sample, and at least one case in each category was

checked. Table 7 shows the agreement percentages and coefficients of journalistic formats and website-related variables. All variables reached the 0.80 reliability standard at this stage.

Table 7. Inter-Coder Reliability Results of Website-Related Variables (N=85).

	Agreement Percentages (%)	Coefficients (Gwet's AC₁)
Journalistic Formats	89.41	0.82
USS Sites	94.11	0.91
Mission Types	97.65	0.97

Data Cleaning

The goal of this study is to examine factors predicting viewpoint diversity, and one of the most crucial variables is the workforce (i.e., professional vs. citizen journalists). Among 711 sampled stories, 100 of them were adopted from wire services, and 44 stories lacked authorship information. This study excluded stories adopting wire services, for two reasons. First, the use of wire services suggests that duplicate stories were sampled in the data. Second, the same content distributed on different types of news sites may hinder the real influence of media routines, organizational factors, and extramedia factors on media content. Although the use of wire-service stories may possibly be influenced by the gatekeeping process in a media organization, it cannot reflect resources of the distributed sites, media capability of making the news, and the resources offered to serve the community. Therefore, this study only included stories authored by staff writers in order to examine the direct influence from media routines, the organizations, and the community.

Also, this study treated stories without authorship information as missing cases. Since the authorship was undetermined (i.e., the story could be adopted from wire services), it is hard to claim that the content is directly influenced by the characteristics of the sites. After deleting these stories, the number of articles in this sample was 566. The distribution of events in each variable

stayed similar after data cleaning. However, percentages of news stories decreased after deleting stories authored by wire services (see Table 8).

Table 8. The Comparison of Percentages before and after Data Cleaning for All Independent Variables (%).

Independent Variables		711 Stories	566 Stories
Journalistic Formats	Opinion	28.55	32.5
	News	71.45	67.5
Media Type	Online-only	40.23	41
	Others	59.77	59
Information Sources*	Grassroots	46.4	45.2
	Others	53.6	54.8
Mission	Environmental	9.70	10.4
	Others	90.3	89.6
Ownership	Non-profit	18.3	18.9
	Commercial	81.7	81.1
USS	USS	26.0	27.2
	Others	74.0	72.8
Community Focus	Yes	24.62	20.8
	No	75.38	79.2

* The percentages of grassroots sources were calculated by the number of grassroots sources providing rationales to all sources providing rationales.

Restructuring the Data

In order to analyze the data at the level of viewpoints, data were restructured from story-based units into viewpoints-based units. Data were restructured by using the following commands in SPSS version 22: Data > Restructure > Restructure selected variables into cases. Results showed 1,569 viewpoints/cases were included in the data. The most frequently presented viewpoints remained the same—opposing Arctic drilling on reasons of ecological sustainability ($n=433$, 27.6%) and technical efficiency ($n=344$, 21.9%), and favoring drilling because of market performance ($n=221$, 14.1%) and technical efficiency ($n=168$, 10.7%). All other viewpoints were defined as minority viewpoints ($n=403$, 25.69%, see Table 9). The minimum number of events

per variable (EPV) was 50 ($403/8=50.38$). The events of each category in all independent variables were over 30 (see Table 10).¹⁵

Table 9. Categories of Viewpoints by Frequency and Percentages (N=1,569).

	Justifications	Positions	Frequency	Percentages (%)
Major Viewpoints	Ecological Sustainability	Opposing	433	27.6
	Technical Efficiency	Opposing	344	21.9
	Market Performance	Positive	221	14.1
	Technical Efficiency	Positive	168	10.7
Minority Viewpoints	Civic Equality	Opposing	117	7.5
	Market Performance	Opposing	112	7.1
	Inspirational Expression	Opposing	63	4
	Moral Principle	Opposing	46	2.9
	Popularity	Opposing	26	1.7
	Civic Equality	Positive	7	0.4
	Ecological Sustainability	Positive	6	0.4
	Market Performance	Neutral	6	0.4
	Moral Principle	Positive	6	0.4
	Inspirational Expression	Positive	4	0.3
	Technical Efficiency	Neutral	2	0.1
	Ecological Sustainability	Neutral	2	0.1
	Inspirational Expression	Neutral	3	0.2
	Civic Equality	Neutral	1	0.1
	Moral Principle	Neutral	2	0.1
Total			1,569	100

¹⁵ The problem of low-prevalence predictors is found when the EPV is as low as 2-4 and when the number of events of the variable is fewer than 30. With increasing sample size and the number of events in the variable, the problems of validity in the logistic regression model would be solved (Vittinghoff & McCulloch, 2007).

Table 10. Frequencies and Percentages of All Independent Variables after Restructuring the Data into Viewpoint-Based Cases (N=1,569).

Independent Variables		Counts	Percentages %
Workforce	Citizen	185	11.8
	Professionals	1384	88.2
Journalistic Formats	Opinion	375	23.9
	News	1194	76.1
Media Type	Online-only	641	40.9
	Others	928	59.1
Grassroots Sources*	Grassroots	709	45.2
	Others	860	54.8
Mission	Environmental	143	9.1
	Others	1426	90.9
Ownership	Non-profit	278	17.7
	Commercial	1291	82.3
USS	USS	440	28.0
	Others	1129	72.0
Community Focus	Yes	345	22.0
	No	1224	78.0

Data Analysis Methods

RQ1a: Will news be more likely to use grassroots sources to present viewpoints when they are authored by citizen contributors than by professional journalists?

To answer RQ1a, the Phi coefficients will be measured between the two dichotomous variables: workforce and information sources. The values of Phi coefficients will be between -1 and +1 to indicate the strength of the correlation.

To test all hypotheses and RQ1b, an eight-predictor logistic model will be fitted to the data to examine the relationship between the likelihood that a minority viewpoint presented in the news and the eight predictors—workforce, information source, media types, journalistic formats, USS sites, ownership, mission types, and community focus. To report the results, the individual regression coefficients will be estimated using the Wald chi-square statistic. They will

indicate the directions and the strengths of each pair of relationships. The odds ratio of each coefficient will be reported to interpret the results.

To answer RQ2a and RQ2b, two seven-predictor logistic regression models will be computed to explore the stronger predictors of minority viewpoints between professional and citizen journalists' articles.

Summary

In summary, 711 stories were randomly collected by using 51 exact keyword search from *Google News* database and Knight and Columbia database on the topic of Arctic oil drilling. The recall test was done to make sure over 90% of the relevant stories in the sampling frame have the equal chance to be randomly selected to the sample. The consistency of the measurement was tested by computing the AC₁ coefficients in inter-coder reliability tests. After data cleaning and restructuring, a total of 1,569 viewpoints were included in the sample.

CHAPTER 3

RESULTS

Introduction

This chapter will present the results of Phi correlations and logistic regression models computed on 1,569 viewpoints from 566 news articles under the hierarchical model of influences as the conceptual framework. The chapter will begin with descriptive analysis by interpreting correlation coefficients of all variables, and then six hypotheses and four research questions will be tested and answered by computing Phi coefficients and logistic regression models.

Data Overview

Features of citizen journalism. This study suggests that citizens involved in news production processes at different levels—being an information source or the author of an article—and their involvement were related to different features of citizen journalism: in the format of opinion pieces, serving local/regional communities, and published on online-only, not-for-profit, and USS news sites.

Data showed that news content authored by citizen contributors was more likely in the format of opinion pieces ($\Phi=.360, p<.001$) on online-only ($\Phi=.138, p<.001$) and non-profit ($\Phi=.234, p<.001$) news sites (see Table 11). However, professional journalists, other than citizen contributors, were more likely to write about the issue on local/regional news sites ($\Phi=-.123, p<.001$). Also, news content on USS sites was not necessarily authored by citizen contributors ($\Phi=.014, p>.05$). The absence of significant correlation indicated that news content authored by citizens was not always published on USS sites, and articles published on the USS sites were not necessarily authored by citizen contributors. This finding further confirmed the

effort made by this study to distinguish citizen journalism from the individual level to the organizational level.

Table 11. Correlation Coefficients among All Independent Variables.

		Workforce	Grassroots	Mission	USS	Journalistic Formats	Community Focus	Online-Only	Ownership
Workforce	Phi	1							
Grassroots	Phi	-.054*	1						
Mission	Phi	.138***	.034	1					
USS	Phi	.014	.075**	-.030	1				
Journalistic Formats	Phi	.360***	-.100***	.035	.013	1			
Community Focus	Phi	-.123***	.003	-.168***	-.184***	-.063*	1		
Online-Only	Phi	.138***	-.036	.147***	-.103***	.021	-.235***	1	
Ownership	Phi	.234***	-.042	.271***	.015	.210***	-.081**	.195***	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

*** Correlation is significant at the 0.001 level (2-tailed).

Citizen journalism and environmental news sites. This study identified 29 environmental news sites reporting on Shell's Arctic oil drilling (see Table 12). None of the sites provided services solely to the state of Alaska, Oregon, or Washington (community focus). The claimed service area of the environmental sites ranged from the United States ($n=12$, 41.38%) to the globe ($n=14$, 48.28%), and another three (10.34%) websites were based outside the United States. Few environmental sites ($n=7$, 24.14%) accepted user-submitted stories. About half ($n=15$, 51.72%) of them published online-only content, and 16 (55.17%) of them were owned by not-for-profit organizations.

Compared to the same features on other news sites, environmental sites had higher percentages as online-only and non-profit sites and lower percentages of community-focused and USS sites (see Table 13). The data showed that articles about Arctic oil drilling published on local/regional sites were not from those focused on environmental issues but from general news sites. Environmental sites publishing relevant stories were more likely to be online-only ($\Phi=.147$, $p<.001$) and non-profit sites ($\Phi=.271$, $p<.001$) than general news sites (see Table 11).

Table 12. List of Environmental News Sites and the Features of the Sites (N=29).

Environmental Sites	Community Focus	USS	Online-only	Non-profits
audubon.org	0	0	0	1
biologicaldiversity.org	0	0	0	1
cleantechnica.com	0	0	0	0
climatecentral.org	0	0	0	1
climatesciencewatch.org	0	0	0	1
blog.ucsusa.org	0	0	0	1
desmogblog.com	0	0	1	0
earthisland.org	0	1	0	1
earthjustice.org	0	0	0	1
ecowatch.org	0	0	1	0
eenews.net	0	0	1	0
energydesk.greenpeace.org	0	0	1	1
ens-newswire.com	0	1	0	0
environmentalleader.com	0	1	1	0
gas2.org	0	0	1	0
greenerideal.com	0	0	1	0
greenpeace.org	0	0	0	1
greenpeace.org.uk	0	0	0	1
greentechmedia.com	0	0	1	0
grist.org	0	0	1	1
inhabitat.com	0	1	1	0
insideclimatenews.org	0	1	1	1
mnn.com	0	0	1	0
newsecuritybeat.org	0	0	0	1
nrdc.org	0	1	1	1
roadtoparis.info	0	1	1	1
theecologist.org	0	0	0	0
treehugger.com	0	0	1	0
wwf.panda.org	0	0	0	1

* 0=features do not exist; 1=features exist.

Table 13. The Comparison between Environmental and General News Sites with the Features of Community Focus, USS, Media Type, and Ownership.

	Community Focus		USS		Online-only		Non-profits	
	n	%	n	%	n	%	n	%
Environmental sites	0	0	7	24.14	15	51.72	16	55.17
General sites	30	10.24	98	33.45	121	41.30	54	18.28

Predicting Minority Viewpoints: Correlations

Issue position. The correlation tests were first computed among all independent variables and issue positions (see Table 14). Among all positions giving rationales, the majority opposed Arctic drilling ($n=1141$, 72.7%), and only a quarter favored the drilling ($n=412$, 26.3%). Few positions were neutral ($n=16$, 1.0%). The Phi coefficients were calculated to measure the associations between two binary variables. Results first showed significantly weak and positive correlations between professional journalists and positive positions ($\Phi=.052$, $p<.05$), and commercial ownership and positive positions ($\Phi=.064$, $p<.05$).

For environmental and USS news sites, each had a weak and negative association with positive positions ($\Phi=-.073$; $-.082$, $p<.01$), and a weak and positive association with opposing positions ($\Phi=.080$; $.067$, $p<.01$). In other words, environmental and USS sites associated with presenting more opposing positions and less positive positions. Similar but stronger correlations were found between grassroots sources and issue positions. Grassroots sources associated with presenting more opposing positions ($\Phi=.453$, $p<.001$) and less positive positions ($\Phi=-.443$, $p<.001$).

Table 14. Phi Correlation Coefficients between Independent Variables and Issue Position (N=1,569).

	Grassroots	Workforce	Mission	USS	Journalistic Formats	Community Focus	Washington	Alaska	Online- Only	Ownership	Positive Position	Opposing Position
Grassroots	1											
Workforce	-.054*	1										
Mission	.034	-.138***	1									
USS	.075**	.014	-.030	1								
Journalistic Formats	-.100***	.360***	.035	.013	1							
Community Focus	.003	-.123***	-.168***	-.184***	-.063*	1						
Washington	.000	-.087**	-.109**	-.053*	-.071**	.648***	1					
Alaska	-.011	-.071**	-.111**	-.210***	-.005	.661***	-.121***	1				
Online-Only	-.036	.138***	.147***	-.103***	.021	-.235***	-.054*	-.246***	1			
Ownership	-.042	.234***	.271***	.015	.210***	-.081**	-.078**	-.056*	.195***	1		
Positive Position	-.443***	-.052*	-.073**	-.082**	-.008	.022	-.069**	.106***	-.022	-.064*	1	
Opposing Position	.453***	.060*	.080**	.067**	.004	-.017	.076***	-.106***	.017	.067**	-.974***	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

*** Correlation is significant at the 0.001 level (2-tailed).

Originally, there was no association found between community focus and issue position. Because the state of Washington and Alaska were two different regions, the public opinion on the issue may be different in terms of influencing media content. Correlation coefficients were computed between Washington state and issue positions, and Alaska and issue positions. The results indicated opposite directions in Washington and Alaska. Stories published by regional media in Washington associated with presenting more opposing positions ($\Phi=.076, p<.001$) and fewer positive positions ($\Phi=-.069, p<.01$). Conversely, stories published by Alaskan regional media associated with presenting more positive positions ($\Phi=.106, p<.001$) and fewer opposing positions ($\Phi=-.106, p<.001$).

Major viewpoints. Correlation coefficients were computed among all independent variables and four major viewpoints—positive market performance (PosMar), positive technical efficiency (PosT), opposing technical efficiency (OppT), and opposing ecological sustainability (OppE).

Results first showed significantly weak and positive correlations between citizen contributors and OppE ($\Phi=.066, p<.01$), and non-profit organizations and OppE ($\Phi=.050, p<.05$, see Table 15). Also, professional journalists associated with presenting PosT ($\Phi=-.050, p<.05$).

Environmental news sites had a weak and negative association with PosMar ($\Phi=-.058, p<.05$), and a weak and positive association with OppE ($\Phi=.067, p<.01$). For USS news sites, they had a weak and negative association with PosT ($\Phi=-.065, p<.05$). Grassroots sources associated with presenting more OppT ($\Phi=.119, p<.001$) and OppE ($\Phi=.279, p<.001$), while presenting less PosMar ($\Phi=-.287, p<.001$) and PosT ($\Phi=-.269, p<.001$).

Table 15. Phi Correlation Coefficients between Independent Variables and Major Viewpoints (N=1,569).

	Workforce	Journalistic Formats	Online- Only	Grassroots	Mission	USS	Ownership	Washington	Alaska	PosMar	PosT	OppT	OppE
Workforce	1												
Journalistic Formats	.360***	1											
Online-Only	.138***	.021	1										
Grassroots	-.054*	-.100***	-.036	1									
Mission	-.138***	-.035	-.147***	.034	1								
USS	.014	.013	-.103***	.075**	-.030	1							
Ownership	.234***	.210***	.195***	-.042	.271***	.015	1						
Washington	-.087**	-.071**	-.054*	.000	-.109***	-.053*	-.078**	1					
Alaska	-.071**	-.005	-.246***	-.011	-.111***	-.210***	-.056*	-.121***	1				
PosMar	-.017	-.004	-.009	-.287***	-.058*	-.033	-.030	-.038	.075**	1			
PosT	-.050*	-.001	-.019	-.269***	-.045	-.065*	-.047	-.066**	.050*	-.140***	1		
OppT	.036	-.033	-.008	.119***	.030	.022	-.016	-.042	-.008	-.215***	-.184***	1	
OppE	.066**	-.008	.024	.279***	.067**	.040	.050*	.057*	-.066**	-.250***	-.214***	-.327***	1

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Stories published by regional media in Washington associated with presenting more OppE ($\Phi=.057, p<.05$) and less PosT ($\Phi=-.066, p<.01$). Stories published by Alaskan regional media associated with presenting more PosMar ($\Phi=.075, p<.01$) and PosT ($\Phi=.050, p<.05$), while presenting fewer instances of OppE ($\Phi=-.066, p<.01$).

Minority viewpoints. Correlation coefficients were computed among all independent variables and all minority viewpoints—opposing market performance (OppMar), positive civic equality (PosC), opposing civic equality (OppC), neutral civic equality (NeuC), positive inspirational expression (PosI), opposing inspirational expression (OppI), neutral inspirational expression (NeuI), positive moral principle (PosMor), opposing moral principle (OppMor), neutral moral principle (NeuMor), opposing popularity (OppP), positive ecological sustainability (PosE), and neutral ecological sustainability (NeuE).

Results showed that only four independent variables were associated with individual minority viewpoints (see Table 16). Opinion pieces correlated with presenting more OppMar ($\Phi=.071, p<.01$). Stories published on online-only sites were less likely presenting PosE ($\Phi=-.051, p<.05$).

Grassroots sources positively associated with several opposing viewpoints: OppI ($\Phi=.075, p<.01$), OppMor ($\Phi=.115, p<.001$), and OppP ($\Phi=.053, p<.05$). Also, they negatively associated with four positive viewpoints and one opposing viewpoints: PosC ($\Phi=-.061, p<.05$), PosMor ($\Phi=-.056, p<.05$), PosE ($\Phi=-.056, p<.05$), and OppMar ($\Phi=-.068, p<.001$).

Regional media in Washington tended to present more OppC ($\Phi=.052, p<.05$) and OppP ($\Phi=.150, p<.001$). Among Alaska-based media, they presented less OppMar ($\Phi=-.058, p<.05$).

Table 16. Phi Correlation Coefficients between Independent Variables and Minority Viewpoints (N=1,569).

	Journalistic Formats	Online- Only	Grassroots	Washington	Alaska	OppMar	PosC	OppC	OppI	PosMor	OppMor	OppP	PosE
Journalistic Formats	1												
Online-Only	.021	1											
Grassroots	-.100***	-.036	1										
Washington	-.071**	-.054*	.000	1									
Alaska	-.005	-.246***	-.011	-.121***	1								
OppMar	.071**	.047	-.068**	-.023	-.058*	1							
PosC	-.015	.003	-.061*	.039	-.023	-.019	1						
OppC	.029	-.024	.015	.052*	.017	-.079**	-.019	1					
OppI	-.023	-.031	.075**	.014	.022	-.057*	-.014	-.058*	1				
PosMor	-.011	.033	-.056*	.046	.044	-.017	-.004	-.018	-.013	1			
OppMor	-.009	.002	.115***	-.023	-.025	-.048	-.012	-.049	-.036	-.011	1		
OppP	-.003	.004	.053*	.150***	-.030	-.036	-.009	-.037	-.027	-.008	-.023	1	
PosE	-.011	-.051*	-.056*	-.021	.044	-.017	-.004	-.018	-.013	-.004	-.011	-.008	1

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Predicting Minority Viewpoints: Research Questions and Hypotheses

The correlation between workforce and information source. Research question 1 asked whether a positive relationship exist between workforce and information source.

RQ1a: Will news authored by citizen contributors be more likely to use grassroots sources than news published by professional journalists?

To answer RQ1a, the Phi coefficient was measured between the two dichotomous variables: workforce and information sources. The results showed that workforce weakly and negatively associated with the use of grassroots sources ($\Phi = -.054$, $p < .05$). Professional journalists were more likely than citizen contributors to adopt grassroots sources in stories about Shell's Arctic oil drilling. The negative direction showed a reverse correlation to RQ1a.

Predicting minority viewpoints for all cases.

RQ1b: Will citizens or advocacy groups (grassroots sources) be more likely to present minority viewpoints than other types of sources?

H1a: News authored by citizen contributors will be more likely to include minority viewpoints than news authored by professional journalists.

H1b: Opinion pieces will be more likely to present minority viewpoints than news stories.

H1c: News published on online-only news sites will be more likely to present minority viewpoints than news published on traditional news sites.

H2a: News published by non-profit organizations will be more likely to present minority viewpoints than news published by commercial organizations.

H2b: News published on news sites that accept user-submitted stories will be more likely to include minority viewpoints than news published on news sites that do not accept user-submitted stories.

H2c: News published by environmental sites will be more likely to present minority viewpoints than news published by news sites with different missions.

H3: News published by regional media will be more likely to present minority viewpoints than news published by national news outlets.

To test all hypotheses and RQ1b, an eight-predictor logistic model was fitted to the data to examine the relationship between the likelihood that a minority viewpoint presented in the news and the eight predictors—workforce, information source, media types, journalistic formats, USS sites, ownership, mission types, and community focus. The model was computed using SPSS Statistics version 22 in the Windows 10 environment.

To test whether any two independent variables were strongly correlated (referred to as “multicollinearity”), all independent variables and the dependent variable were tested in the linear regression model. The justification for using linear regression model to test categorical variables is that the multicollinearity test mainly examines the correlations between any two independent variables without considering the categorical dependent variable. The tolerance values, the percent of the variance that cannot be explained by other predictor, were much higher than the criterion of 0.1. Also, the variance inflation factors (VIFs), measured by $1/\text{tolerance}$, were much lower than 10, as a rule of thumb. Therefore, the model was not affected by the multicollinearity issue.

The logistic regression was performed to test influences of workforce, media type, information source, journalistic formats, mission type, ownership, USS sites, and community focus. Results indicated that the eight-predictor model provided a statistically significant improvement over the constant-only-model, $\chi^2(8, N=1,569) = 17.14, p < .05$. The Nagelkerke R^2 indicated that the model accounted for 1.6% of the total variance. The pseudo R^2 values are

usually lower in the logistic regression model than in the linear regression model (Petrucchi, 2009). The correct prediction rate was about 74.3%. The Wald tests showed that three out of eight predictors significantly predicted the representation of minority viewpoints in the news (see Table 17).

Table 17. Logistic Regression Analysis Predicting Minority Viewpoints (N=1,569).

Predictor	β	$SE\beta$	Wald's X^2	df	sig.	e^β (odds ratio)
Constant	-1.077	.273	15.592	1	.000	
Workforce (1 = citizen)	-.591	.212	7.751	1	.003	.554
Information Source (1 = grassroots sources)	.109	.118	.858	1	.354	1.115
Media types (1 = Online-only)	.113	.127	.791	1	.374	1.119
Journalistic formats (1 = Opinions)	.375	.145	6.709	1	.005	1.455
USS sites (1 = USS)	.098	.133	.536	1	.464	1.103
Ownership (1 = Non-profits)	.159	.163	.949	1	.330	1.172
Mission types (1 = Environmental)	-.112	.221	.255	1	.614	.894
Community Focus (1 = Yes)	.260	.146	3.161	1	.075	1.296

Note. All statistics reported herein use 3 decimal places.

For workforce, professional journalists were 1.81 times more likely than citizen contributors to present minority viewpoints ($\beta = -.591$, $p < .01$, one-tailed). For journalistic formats, the probability of presenting minority viewpoints in opinion pieces was 1.12 times greater than the probability in news stories ($\beta = .375$, $p < .01$, one-tailed). For community focus, stories published by regional media in Alaska, Oregon, or Washington were 1.17 times more likely to present minority viewpoints versus stories published by other news sites ($\beta = .260$, $p < .05$, one-tailed). However, the parameter estimates revealed no difference between five independent variables—media type, information source, USS sites, ownership, and mission type—and the representation of minority viewpoints.

The relationship between workforce and minority viewpoint was in a reverse direction of the hypothesized relationship. Thus, hypothesis 1a was not supported even with statistical

significance. H1b and H3 were supported that opinion pieces and community media positively predicted the representation of minority viewpoints. By examining 1,569 viewpoints coded from 566 staff-written stories, the representation of minority viewpoints was predicted at the levels of media routines (workforce and journalistic formats) and social institutions (community focus).

Predicting professional journalists' presence of minority viewpoints.

RQ2b: Among all professional journalists' work, what factors predict their use of minority viewpoints?

To answer RQ2b, a seven-predictor logistic regression model was computed to explore factors presenting minority viewpoints among professional journalists. After selecting cases authored by professional journalists, the EPV was 52 ($367/7=52.43$). The events of all independent variables were over 30.¹⁶

The logistic regression was performed to test influences of media type, information source, journalistic formats, mission type, ownership, USS sites, and community focus. Results indicated that the seven-predictor model did not provide a statistically significant improvement over the constant-only-model, $\chi^2 (7, n=1,384) = 10.15, p > .05$. The Nagelkerke R^2 indicated that the model accounted for 1.1% of the total variance. Goodness of fit was assessed through the Hosmer-Lemeshow test, with p values greater than .05 signifying better fit (no difference) between the final model and the observed data, $\chi^2 (8, n=1,384) = 3.20, p > .05$. The correct prediction rate was about 73.5%.

The Wald tests showed that one out of seven predictors significantly predicted the representation of minority viewpoints by professional journalists (see Table 18). For journalistic

¹⁶ The problem of low-prevalence predictors is found when the EPV is as low as 2-4 and when the events of the variable is fewer than 30. With increasing sample size and the number of events in the variable, the problems of validity in the logistic regression model would be solved (Vittinghoff & McCulloch, 2007).

formats, the probability of presenting minority viewpoints in opinion pieces was 1.42 times greater than the probability in news stories ($\beta=.352$, $p<.05$, two-tailed). The parameter estimates revealed no difference between six independent variables—media type, information source, USS sites, ownership, mission type, and community focus—and the representation of minority viewpoints. To answer RQ2b, journalistic formats was the only predictor to explain minority viewpoints presented by professional journalists. The non-significance of model fit and the weak pseudo R^2 indicated that the proposed model did not explain the representation of minority viewpoints very well.

Table 18. Logistic Regression Analysis Predicting Minority Viewpoints among Professional Journalists ($n=1,384$).

Predictor	β	$SE\beta$	Wald's X^2	df	sig.	e^β (odds ratio)
Constant	-1.667	.234	50.829	1	.000	
Information Source (1 = grassroots sources)	.140	.124	1.279	1	.258	1.150
Media types (1 = Online-only)	.138	.135	1.041	1	.308	1.148
Journalistic formats (1 = Opinions)	.352	.158	4.981	1	.026	1.422
USS sites (1 = USS)	.135	.141	.906	1	.341	1.144
Ownership (1 = Non-profits)	.075	.183	.168	1	.682	1.078
Mission types (1 = Environmental)	-.083	.245	.114	1	.736	.921
Community Focus (1 = Yes)	.264	.150	3.094	1	.079	1.302

Note. All statistics reported herein use 3 decimal places.

Predicting citizen contributors' presence of minority viewpoints.

RQ2a: Among all citizen contributors' work, what factors predict their use of minority viewpoints?

Among all 1,569 viewpoints, only 185 viewpoints were adopted by citizen contributors. Among the 185 viewpoints, only 36 (19.5%) were minority viewpoints. Also, due to the smaller sample size ($n=185$), one of the independent variables, community focus, contained only 15 viewpoints published by regional media in Alaska, Oregon, or Washington states. The problem

of low-prevalence predictors was found to predict citizen contributors representing minority viewpoints. After selecting only citizen contributors' viewpoints in the model, the EPV was as low as 5 ($36/7=5.14$).

To reduce bias due to small sample size, the analysis was computed using Firth logistic regression (also known as “penalized likelihood”), which introduced a bias term when using maximum likelihood estimation (Firth, 1993). The R extension program, Tools for SPSS Statistics Products, was installed into SPSS version 24 in the Windows 10 environment. The command Analysis > Regression > Firth Logistic Regression was performed to compute the model.

The Firth logistic regression was performed to test influences of media type, information source, journalistic formats, mission type, ownership, USS sites, and community focus among citizen contributors. Results indicated that the seven-predictor model did not provide a statistically significant improvement over the constant-only-model, $\chi^2 (7, n=185) = 7.01, p > .05$. The penalized log likelihood estimations showed that one out of seven predictors significantly predicted the representation of minority viewpoints by citizen contributors (see table 19).

Table 19. Firth Logistic Regression Analysis Predicting Minority Viewpoints among Citizen Contributors (n=185).

Predictor	β	SE	X^2	sig.	e^β (odds ratio)
Constant	-1.914	.789	6.747	.009	
Information Source (1 = grassroots sources)	-.203	.392	.275	.600	.816
Media types (1 = Online-only)	.071	.418	.030	.863	1.074
Journalistic formats (1 = Opinions)	.918	.479	3.981	.046	2.504
USS sites (1 = USS)	-.318	.437	.550	.458	.728
Ownership (1 = Non-profits)	.754	.425	3.282	.070	2.125
Mission types (1 = Environmental)	-.486	.569	.774	.379	.615
Community Focus (1 = Yes)	-.225	.655	.125	.724	.799

Note. All statistics reported herein use 3 decimal places.

Similar to the results among professional journalists, the probability of presenting minority viewpoints in opinion pieces was 2.5 times greater than the probability in news stories ($\beta=.918$, $p<.05$, two-tailed). The parameter estimates revealed no difference between six independent variables—media type, information source, USS sites, ownership, mission type, and community focus—and the representation of minority viewpoints. To answer RQ2a, journalistic formats was the only predictor to explain minority viewpoints presented by citizen contributors. The non-significance of model fit indicated that the proposed model did not explain the representation of minority viewpoints very well.

Re-Examining the Results

Relationships were interfered by issue position. Stories authored by professional journalists, published by commercial organizations, or published by Alaskan media were more likely to present positive viewpoints and less likely to present opposing viewpoints. In contrast, stories authored by citizen contributors; formatted as opinions; citing grassroots sources; and published by non-profit, online-only, environmental, USS, and Washington-based news sites were more likely to present opposing positions and less likely to present positive positions. From the correlation table (see Table 14), the Phi coefficients indicated that several independent

variables were associated with positive or opposing viewpoints. This is because some independent variables had a tendency to present positive/opposing positions.

However, the coding of minority viewpoints did not reflect the difference between positive and opposing positions. For example, grassroots sources were more likely to present OppI, OppMor, and OppP and less likely to present PosC, PosMor, and PosE (see Table 16). When the less frequently cited opposing and positive viewpoints were coded into one variable, “minority viewpoints,” the relationship between the use of grassroots sources and the representation of all minority viewpoints became hard to interpret. Certain types of reporters, journalistic formats, and organizations prefer presenting opposing and minority viewpoints, and the tendency may be eliminated by the negative relationship with positive and minority viewpoints.

Recoding community focus and minority viewpoints. Accordingly, this study adopted seven out of the original eight independent variables—workforce, journalistic formats, media type, information sources, USS, mission type, ownership—and recoded the variable community focus into two variables: Washington and Alaska. As reported earlier, articles published by regional media in Washington tended to present opposing views, while Alaskan-based local media preferred presenting positive views. The Washington variable contained two codes (1 = Washington-based regional media; 0 = others). A total of 166 viewpoints (10.6%) were published by regional media in Washington State. Similarly, the Alaska variable contained two codes (1 = Alaskan regional media; 0 = others). The frequency of viewpoints published in Alaskan local media was 172 (11.0%).

The dependent variable was further recoded into two variables: positive minority viewpoints and opposing minority viewpoints. The positive minority viewpoints were coded as 1

= positive minority viewpoints ($n = 23$, 1.5%) and 0 = other viewpoints ($n = 1546$, 98.5%). The opposing minority viewpoints contained two codes (1 = opposing minority viewpoints; 0 = other viewpoints). The number of opposing and minority viewpoints was 364 (23.2%) and the frequency of other viewpoints was 1,205 (76.8%).

Predicting positive minority viewpoints. The logistic regression was performed to test influences of nine independent variables on the representation of positive and minority viewpoints. The problem of low prevalence predictors was found to predict positive and minority viewpoints. The total number of positive and minority viewpoints was 23 (1.5%). After recoding minority viewpoints into the new variable positive minority viewpoints, the EPV in this model was as low as 2 ($23/9=2.56$). To reduce bias due to small sample size and extremely uneven categories, the analysis was computed by using Firth logistic regression. The R extension program, Tools for SPSS Statistics Products, was installed into SPSS version 24 in the Windows 10 environment.

The Firth logistic regression was computed to test influences of workforce, media type, information source, journalistic formats, mission type, ownership, USS sites, Washington, and Alaska on presenting positive and minority viewpoints. Results indicated that the nine-predictor model provided a statistically significant improvement over the constant-only-model, $\chi^2(9, n = 1,569) = 26.43, p < .01$. The penalized log likelihood estimations showed that one out of nine predictors, information sources, significantly predicted the representation of positive and minority viewpoints, and another variable Alaska marginally predicted positive minority viewpoints (see Table 20).

Table 20. Firth Logistic Regression Analysis Predicting Positive Minority Viewpoints (N=1,569).

Predictor	β	SE	X^2	sig.	e^β (odds ratio)
Constant	-3.563	.400		.000	
Information Source (1 = grassroots sources)	-2.540	.790	18.173	.000	.079
Media types (1 = Online-only)	.033	.430	.005	.943	1.033
Journalistic formats (1 = Opinions)	-.382	.522	.497	.481	.682
USS sites (1 = USS)	-.491	.567	.726	.394	.612
Ownership (1 = Non-profits)	-.648	.659	.922	.337	.523
Mission types (1 = Environmental)	.900	.621	1.617	.204	2.460
Alaska (1 = Yes)	.916	.553	2.348	.125	2.499
Washington (1 = Yes)	.750	.558	1.514	.219	2.117

Note. All statistics reported herein use 3 decimal places.

For information sources, non-grassroots sources were 12.68 times more likely to present positive minority viewpoints than grassroots sources ($\beta = -2.54$, $p < .001$). For Alaska, the probability of presenting positive minority viewpoints in Alaskan media was 2.50 times greater than other media ($\beta = .916$, $p = .125$, two-tailed; $p = .063$, one-tailed). The parameter estimates revealed no difference between seven independent variables—workforce, media type, information source, USS sites, ownership, mission type, and Washington – and the representation of positive minority viewpoints.

Predicting opposing minority viewpoints. The second logistic regression model was performed to test influences of nine independent variables on the representation of opposing and minority viewpoints. The total number of opposing and minority viewpoints was 364, and the EPV in this model was 40 ($364/9 = 40.44$). All independent variables had frequencies over 30 in the less popular categories. A standard logistic regression model was performed in SPSS version 24.

Results indicated that the nine-predictor model provided a statistically significant improvement over the constant-only-model, $\chi^2 (9, N = 1,569) = 26.82$, $p < .01$. The Nagelkerke R^2 indicated that the model accounted for 2.6% of the total variance. The pseudo R^2 values are

usually lower in logistic regression model than in linear regression model (Petrucchi, 2009). The correct prediction rate was about 76.8%. The Wald tests showed that four out of nine predictors significantly predicted the representation of opposing minority viewpoints, and one variable marginally predicted the dependent variable (see Table 21).

Table 21. Logistic Regression Analysis of Predicting Opposing Minority Viewpoints ($n=1,569$).

Predictor	β	$SE\beta$	Wald's X^2	df	sig.	e^β (odds ratio)
Constant	1.320	.282	21.905	1	.000	
Information Source (1 = grassroots sources)	.338	.122	7.697	1	.006	1.402
Media types (1 = Online-only)	-.001	.132	.000	1	.995	.999
Journalistic formats (1 = Opinions)	.399	.149	7.127	1	.008	1.490
USS sites (1 = USS)	-.017	.140	.014	1	.905	.983
Ownership (1 = Non-profits)	.270	.168	2.591	1	.107	1.310
Mission types (1 = Environmental)	-.153	.229	.446	1	.504	.858
Alaska (1 = Yes)	-.244	.220	1.224	1	.269	.784
Washington (1 = Yes)	.418	.186	5.017	1	.025	1.518

Note. All statistics reported herein use 3 decimal places.

For workforce, professional journalists were 1.70 times more likely to present opposing minority viewpoints than citizen contributors ($\beta = -.587$, $p < .05$, two-tailed). For journalistic formats, the probability of presenting opposing minority viewpoints in opinion pieces was 1.49 times greater than in news stories ($\beta = .399$, $p < .01$, two-tailed). For information sources, grassroots sources were 1.40 times more likely to present opposing minority viewpoints versus other sources ($\beta = .338$, $p < .01$, two-tailed). For Washington, stories published by regional media in Washington were 1.52 times more likely to present opposing minority viewpoints versus stories published by other news sites ($\beta = .418$, $p < .05$, two-tailed). For ownership, stories published by non-profit media organization were 1.31 times more likely to present opposing minority viewpoints than by commercial organizations ($\beta = .270$, $p = .107$, two-tailed; $p = .054$, one-tailed).

In sum, after dividing the variable of minority viewpoints into two dependent variables—positive and opposing minority viewpoints, information sources became a significant predictor on both positive and opposing minority viewpoints, but in opposite directions. Also, ownership became a marginal predictor of opposing minority viewpoints. Originally, community focus predicted the overall minority viewpoints. After the separation, more details were revealed about the different positions taken between the states of Washington and Alaska. It further confirms the influences of the social institutions outside the media organizations—the media content tends to correspond to their audiences’ preferences in the communities they served.

Predicting opposing minority viewpoints among professional journalists. To explore what factors predicted the use of positive and opposing minority viewpoints between professional and citizen journalists, four alternative models should be computed—two models to compare professional and citizen journalists’ use of positive minority viewpoints and two models to compare their use of opposing minority viewpoints. However, there were too few cases of positive minority viewpoints presented by citizen contributors ($n = 2$, 1.1%). Therefore, the comparison was only performed on the use of opposing minority viewpoints between professional and citizen journalists.

To compute the model of presenting opposing minority viewpoints by eight independent variables among professional journalists, a standard logistic regression model was calculated because the EPV was 41 ($330/8 = 41.25$) and the rule of thumb, 30 events in each independent variable, was met.

Results indicated that the eight-predictor model provided a statistically significant improvement over the constant-only-model, $\chi^2(8, N = 1,384) = 20.65, p < .01$. The Nagelkerke R^2 indicated that the model accounted for 2.2% of the total variance. The pseudo R^2 values are

usually lower in logistic regression model than in linear regression model (Petrucchi, 2009). The correct prediction rate was about 76.2%. The Wald tests showed that three out of eight predictors significantly predicted the representation of opposing minority viewpoints among professional journalists (see Table 22).

Table 22. Logistic Regression Analysis Predicting Opposing Minority Viewpoints among Professional Journalists ($n=1,384$).

Predictor	β	$SE\beta$	Wald's X^2	df	sig.	e^β (odds ratio)
Constant	-1.868	.242	59.330	1	.000	
Information Source (1 = grassroots sources)	.384	.128	8.915	1	.003	1.468
Media types (1 = Online-only)	.010	.142	.005	1	.944	1.010
Journalistic formats (1 = Opinions)	.387	.163	5.617	1	.018	1.472
USS sites (1 = USS)	.009	.149	.004	1	.950	1.009
Ownership (1 = Non-profits)	.183	.189	.936	1	.333	1.200
Mission types (1 = Environmental)	-.115	.256	.204	1	.652	.891
Alaska (1 = Yes)	-.173	.224	.599	1	.439	.841
Washington (1 = Yes)	.411	.191	4.635	1	.031	1.509

Note. All statistics reported herein use 3 decimal places.

For journalistic formats, the probability of presenting opposing minority viewpoints in opinion pieces was 1.47 times greater than in news stories ($\beta = .387$, $p < .05$, two-tailed). For information sources, grassroots sources were 1.47 times more likely to present opposing minority viewpoints versus other sources ($\beta = .384$, $p < .01$, two-tailed). For Washington, stories published by regional media in Washington were 1.51 times more likely to present opposing minority viewpoints versus stories published by other news sites ($\beta = .411$, $p < .05$, two-tailed).

Predicting opposing minority viewpoints among citizen contributors. To compute the model of the representation of opposing minority viewpoints by eight independent variables among citizen contributors, a Firth logistic regression model was calculated because the EPV was 4 ($34/8 = 4.25$) and the rule of thumb, 30 events in each independent variable, was not met in two independent variables—Washington ($n = 6$, 3.2%) and Alaska ($n = 9$, 4.9%).

The Firth logistic regression was computed to test influences of media type, information sources, journalistic formats, mission type, ownership, USS sites, Washington, and Alaska on the use of opposing minority viewpoints among citizen contributors. Results indicated that the eight-predictor model did not provide a statistically significant improvement over the constant-only-model, $\chi^2(8, n = 185) = 8.91, p > .05$. The penalized log likelihood estimations showed that one out of eight predictors, journalistic formats, significantly predicted the representation of opposing and minority viewpoints, and another variable ownership, marginally predicted opposing minority viewpoints (see Table 23).

Table 23. Firth Logistic Regression Analysis Predicting Opposing Minority Viewpoints among Citizen Contributors ($n=185$).

Predictor	β	SE	X^2	sig.	e^β (odds ratio)
Constant	-2.124	.625	12.977	.000	
Information Source (1 = grassroots sources)	-.139	.396	.125	.724	.870
Media types (1 = Online-only)	.047	.423	.013	.910	1.048
Journalistic formats (1 = Opinions)	.907	.479	3.886	.049	2.477
USS sites (1 = USS)	-.339	.443	.612	.434	.712
Ownership (1 = Non-profits)	.735	.430	3.052	.081	2.085
Mission types (1 = Environmental)	-.488	.569	.780	.377	.614
Alaska (1 = Yes)	-1.689	1.579	1.906	.167	.185
Washington (1 = Yes)	.437	.903	.262	.608	1.548

Note. All statistics reported herein use 3 decimal places.

For journalistic formats, opinion pieces were 2.48 times more likely to present opposing minority viewpoints than news stories ($\beta = .907, p < .05$). For ownership, the probability of presenting opposing minority viewpoints published by non-profit organizations was 2.09 times greater than by commercial media ($\beta = .735, p = .081$, two-tailed; $p = .041$, one-tailed). The parameter estimates revealed no difference between six independent variables—media type, information sources, USS sites, mission type, Alaska, and Washington—and the representation of opposing minority viewpoints.

In sum, after recoding minority viewpoints into the new variable “opposing viewpoints,” the predictors of presenting opposing and minority viewpoints were slightly different from the original model. The representation of opposing minority viewpoints among professional journalists was predicted not only by journalistic formats, but also by information sources and Washington. The results of the alternative model were also different among citizen contributors. The only significant predictor was journalistic formats, and the ownership marginally predicted the use of opposing minority viewpoints.

Summary

The results supported hypotheses H1b and H3 (see Table 21). The relationships were considered weak. The odds ratios of significant relationships were between 1.296 and 1.455 in standard logistic regression models—with the highest odds ratio between journalistic formats and minority viewpoints, and the lowest odds ratio between community focus and minority viewpoints. In Firth logistic regression citizen contributors, the higher odds ratio was between journalistic formats and minority viewpoints ($e^{\beta} = 2.504$), and the lower odds ratio was between ownership and minority viewpoints ($e^{\beta} = 2.125$). However, there were some unexpected findings: professional journalists were more likely than citizen contributors to use grassroots sources and minority viewpoints. To better understand the relationship between all independent variables and the use of minority viewpoints in different positions, further analysis was conducted and revealed that information sources and ownership were added into the model to predict opposing minority viewpoints with the odds ratios between 1.310 and 1.402. Among professional journalists, information sources and Washington were added into the model to predict opposing minority viewpoints with the odds ratios between 1.468 and 1.509. The models

predicting opposing minority viewpoints provided more detailed results to identify what factors contributed to one side of positions, but were lack of contribution to the other side of viewpoints

Table 24. Results of Hypotheses and Research Questions

Hypotheses and Research Questions	Minority Viewpoints	Strengths	Opposing Minority Viewpoints	Strengths
H1a: News authored by citizen contributors will be more likely to include minority viewpoints than news authored by professional journalists.	Not supported	N/A	Not supported	N/A
H1b: Opinion pieces will be more likely to present minority viewpoints than news stories.	Supported	$e^{\beta} = 1.455$	Supported	$e^{\beta} = 1.490$
H1c: News published on online-only news sites will be more likely to present minority viewpoints than news published on traditional news sites.	Not supported	N/A	Not supported	N/A
RQ1a: Will news authored by citizen contributors be more likely to use grassroots sources than news published by professional journalists?	No	N/A	No	N/A
RQ1b: Will citizens or advocacy groups (grassroots sources) be more likely to present minority viewpoints than other types of sources?	No	N/A	Yes	$e^{\beta} = 1.402$
H2a: News published by non-profit organizations will be more likely to present minority viewpoints than news published by commercial organizations.	Not supported	N/A	Marginally supported	$e^{\beta} = 1.310$
H2b: News published on news sites that accept user-submitted stories will be more likely to include minority viewpoints than news published on news sites that do not accept user-submitted stories.	Not supported	N/A	Not supported	N/A
H3: News published by regional media will be more likely to present minority viewpoints than news published by national news outlets.	Supported	$e^{\beta} = 1.296$	Supported	$e^{\beta} = 1.518$
RQ2a: Among all citizen contributors' work, what factors predict their use of minority viewpoints?	Journalistic formats	$e^{\beta} = 2.504$	Journalistic formats	$e^{\beta} = 2.477$
	Ownership (marginal formats)	$e^{\beta} = 2.125$	Ownership (marginal significance)	$e^{\beta} = 2.085$
RQ2b: Among all professional journalists' work, what factors predict their use of minority viewpoints?	Journalistic formats	$e^{\beta} = 1.422$	Journalistic formats	$e^{\beta} = 1.472$
	Community focus (marginal significance)	$e^{\beta} = 1.302$	Washington	$e^{\beta} = 1.509$
			Information sources	$e^{\beta} = 1.468$

CHAPTER 4

DISCUSSION

This study argues that citizen journalism should be examined through difference levels, and its influences on media content should be tested under the framework of Shoemaker and Reese's (1991, 2013) hierarchical model of influences on media content. This study predicted that different levels and features of citizen journalism would increase viewpoint diversity about an environmental issue. The data collected from *Google News* about Arctic oil drilling provide several interesting findings.

Differences between Original Models and Alternative Models

One of the most important findings after dividing minority viewpoints into positive and opposing minority viewpoints is that the source of information becomes a significant predictor of both positive and opposing minority viewpoints. This finding provides new evidence to resolve discrepancies between existing quantitative and qualitative research regarding the relationship between source and content diversity.

Previous empirical research concluded that source diversity did not necessarily facilitate diverse viewpoints in the news (Kuban, , 2007; Voakes et al., 1996). On the contrary, qualitative research concludes that less frequently cited sources should be used to increase content diversity. This study suggests that inclusion of many different types of sources cited in environmental news facilitates the representation of minority viewpoints. Compared to previous research, the findings in this study provide more substantial evidence of the relationship for two main reasons.

First, in the current study, a representative sample was randomly collected by using *Google News* stories published from a wide range of media organizations, and by using 51 exact-word combinations to search for stories. Previous research suffered from a small sample size

($N=143$) (Voakes et al., 1996), or from using a single keyword search to retrieve stories (Kuban, , 2007). A small sample size may increase the risks of type II error so that the null hypotheses would not be rejected, causing the relationship not to be found. The single keyword search left the sampling error unknown. As a result of efforts made to collect a representative sample, this study incorporates 711 articles published on 293 news sites that were found by using a string of 51 exact-word terms that cover more than 90% of the related stories in the *Google News* database.

Second, this study directly measures the relationship between a source type and its viewpoints, and thus gives more details about the relationship. The existing empirical research either measured the aggregate diversity scores between sources and viewpoints, or measured the number of sources in a story and the proportion of issue positions. Neither the aggregate method nor the method measuring issue positions truly assessed which type of sources increased viewpoint diversity. For example, a higher aggregate score in source diversity may simply indicate an even distribution of different types of popular sources in a story. Similarly, a higher aggregate score on content diversity may only identify that a number of popular viewpoints are given the same space in a story. The aggregate method cannot explain how well an alternative viewpoint is freely distributed through a conventional or unconventional source in media content. The allowance of minority or alternative viewpoints freely presented in media is the key of a well-functioning democracy. Moreover, measuring issue positions without identifying various rationales cannot provide information about how well citizens are able to be exposed to diverse viewpoints in order to increase their understanding about an issue.

Therefore, this study examines the relationship between source type and alternative viewpoints more directly, through representative samples. The current empirical results are

consistent with existing qualitative research suggesting that grassroots sources provide alternative angles in environmental news reporting. However, grassroots sources tend to only increase the number of opposing minority views on the issue, while other sources contribute to positive minority views. The results imply that minority viewpoints are voiced through diverse types of information sources, and any preferences to certain types of sources do not benefit citizens' understanding of an issue.

For environmental reporting, the incorporation of citizens' and grassroots' voices contributes to the representation of minority viewpoints favoring environmental sustainability. This finding is consistent with some qualitative studies in environmental news. Carvalho (2000) analyzed how three prestige media represented the climate change issue by considering different actors between 1985 and 1997. Environmental NGOs in the early years often led an oppositional discourse against government and industry. Eklof and Mager (2013) observed articles collected from Swedish news coverage and the Google search engine. They found that articles from both media showed the dominance of governmental, business, and academic sources as the alliance that took the same position on the issue of biofuel controversy. The NGOs, however, were outside of the alliance when presenting the different position in media.

Findings for the Hierarchical Model

The hierarchical model of influences on news content developed by Shoemaker and Reese (1991, 2013) suggests five levels of influences: personal characteristics, media routines, organizational factors, social institutions, and societal ideology. Lower-level factors are constrained by higher-level factors. The results indicate that the influences on the representation of minority viewpoints are mainly at the level of media routines and social institutions, and the variable ownership at the level of organizational factors marginally predicts viewpoint diversity.

Media routines. The original and alternative model show that professional journalists, rather than citizen contributors, present more minority viewpoints in the news. Although citizen contributors are less likely to be bounded to journalistic norms, and have potentials to provide alternative content to fill niches that traditional journalists do not offer, previous content analysis research found that citizen journalism sites published less frequently than daily newspapers (Fico et al., 2013). In this current study, the average number of articles published on USS sites on the issue of Arctic oil drilling is 1.89, while an average of 2.65 articles are published on non-USS sites. With fewer news and opinion articles covering the issue, citizen journalists tend to justify their positions with more popular rationales, rather than providing alternative viewpoints.

Another finding contradicting the direction of the proposed relationship is that professional journalists, rather than citizen contributors, cite more grassroots sources. This result aligns with Fico et al.'s (2013) argument that small budgets and limited resources decrease citizen contributors' use of grassroots sources in political issues. As presented in Table 1, stories and news events sampled in this study were mostly about the discussion of energy policies and rarely about human interests that can be referred to as personal experiences. Therefore, the finding is consistent with Fico et al.'s (2013) conclusions that citizen journalism includes fewer grassroots sources in environmental news.

Journalistic format is an important predictor positively related to all minority viewpoints, including both positive and opposing views among professional and citizen journalists. News articles in the format of op-eds, letters to the editor, blog commentaries, or column articles are more likely than news stories to present opposing and minority viewpoints. Even though news stories pursue balanced reporting about an issue, the new or alternative insights about the issue

are tend to be presented by opinion pieces. The correlation table shows that opposing views justified by moral principles are especially popular among opinion pieces (see Table 16).

The last variable media type at the level of media routines is not a significant predictor of viewpoint diversity. In the sample, nearly half (41.30%) of news sites reporting on Shell's Arctic oil drilling are online-only news sites. Today, online-only sites are varied in terms of their economic support and frequency of publication. An online-only news site can be as small as a personal blog, or as large as a site like *Huffington Post*. The concept of online-only news sites may no longer refer to a single and homogeneous type of media. The diverse characteristics of different online-only sites may explain the non-significant relationship between media type and viewpoint diversity.

Organizational factors. User-submitted stories (USS) is an important feature on citizen journalism sites. Literature suggests that news sites inviting USS implies a goal of engaging the public and increasing public connectivity (Deuze et al., 2007). Thus, news content published by USS-inviting sites should have different specific goals from other sites. The correlation table (see Table 9) identifies a slightly higher use of grassroots sources by USS-inviting sites, and the association can possibly be explained by the goal of public service. However, news sites accepting USS do not present more or fewer minority viewpoints about environmental issues. That is, whether citizen journalism is featured on news sites does not predict viewpoint diversity.

Another predictor, mission type at the organizational level, does not relate to viewpoint diversity because environmental news sites justify their arguments mainly with ecological sustainability (see Table 15). Among all 711 stories, the most popular opposing voices against Arctic drilling were questioning Shell's ability to prevent, or respond to, oil spills in Arctic waters. Due to the environmental focus on these sites, other rationales of opposing views are not

presented frequently. In fact, ecological sustainability as an opposing view can be further categorized into several sub-categories, such as concerns about air pollution, climate change, and making noises that disturb marine creatures. If different concerns about environmental impacts are differentiated into separate views, the results may be different. It is possible that environmental sites present more diverse viewpoints than others within the category of ecological sustainability.

Ownership is an important predictor of content diversity. Previous research found that public radio stations showed greater source diversity than commercial stations (Lacy et al., 2013). Although this current study does not find the correlation between ownership and information sources, which may be due to different measurements of source diversity, stories authored by citizen journalists and published by non-profit organizations marginally predict the use of more minority viewpoints. The marginal correlation is only found in stories presenting opposing minority views and with citizen authorship. This result implies that the economic goal of a media organization still exerts influences on citizen journalists' work.

Social institutions. At this level, the results are consistent with the prediction made by Shoemaker and Reese (1991, 2013) that the more the media targeted certain groups of the audience, the more likely that the content reflected the targeted audience's interests. In Alaska, where the state has economically relied on crude oil production for decades, the positive minority viewpoints are more likely than other viewpoints to be presented by regional media. In Washington, where the state leans toward liberal ideology, the opposing minority views are more likely than other views to be presented on regional media. By controlling other independent variables—workforce, journalistic formats, media type, information sources, USS sites, mission type, and ownership—the findings confirm that local/regional media provide more diverse

viewpoints due to the proximity of an event. Also, the results show that Washington-based regional media increase opposing minority viewpoints and that Alaskan regional media increase positive minority viewpoints, but no other regional, national or global media do. The findings imply that the local/regional media close to the news events sense the community's preferences and accommodate them into media content.

In sum, citizen journalists are constrained by limited resources and organizations' profit-making goals so that their stories do not increase viewpoint diversity on the issue of Arctic oil drilling. However, some minority viewpoints may be represented through citizens' opinion pieces. Unlike professional journalists, citizen contributors' work is less likely to conform to the communities' preferences. Overall, citizens contribute to viewpoint diversity in an environmental issue by being information sources, writing opinion pieces, and submitting stories to non-profit news sites.

Comparative factors to predict the presence of minority viewpoints. Predictors varied for the presence of minority viewpoints expressed in professional and citizen journalists' works. Unexpectedly, journalistic format was the only common predictor, while citizen contributors do not increase viewpoint diversity. Unlike news stories pursuing balanced reporting, opinion pieces function as adding new insights to an issue (Golan & Wanta, 2004). The nature of opinions allows both professional and citizen writers to address alternative viewpoints of an issue.

In addition, professional journalists cite grassroots sources to present opposing minority viewpoints, while citizen journalists are limited on citing grassroots sources. No relationship was found between the use of grassroots sources and expressing opposing minority viewpoints among citizen contributors. The correlation table also show that non-profit organizations are more likely than commercial news sites to publish citizen journalists' work (see Table 11).

Publishing citizen-made news is associated with the goal of engaging the public and encouraging public connectivity (Deuze et al., 2007). Public service is unlikely to be a goal of commercial news media (Picard, 2004). As a result, nonprofit organizations publish more citizens' work than commercial organizations. When citizens' work is published on nonprofit news sites, the content is more likely to present opposing and minority viewpoints (marginal significance) than the content on commercial news sites. Two reasons seem most likely. First, citizens tend to write opinion pieces, by which citizens give new insights for the issue (see Table 9). Second, commercial news sites are more likely to present positive positions rather than opposing positions, and thus commercial sites present fewer opposing and minority viewpoints than nonprofit organizations.

The last difference between two models predicting professional and citizen journalists' use of minority viewpoints is the influences outside the news organization—the community focus. Citizens were found to be less likely to cater to the local residents' tastes, while professional journalists present more positions favored by their regional audiences. Our evidence shows that stories published by Washington-based regional media give more minority rationales to stopping Shell's drilling activities, including questioning the legal process (opposing civic equality) and requiring public input of the government's decisions (opposing popularity).

Does Citizen Journalism Ever Exist in Environmental Reporting?

One of the prominent functions of citizen journalism is promoting civic engagement and informing citizens about public issues (Gillmor, 2006; Rodrigues, 2010). Environmental issues usually require civic engagement and public discussion about all aspects of the issue. To fulfill the ideal of public access to a diversity of ideas, media content should also reflect various

aspects. Therefore, the examination of viewpoint diversity and the role played by citizen journalism in the environmental issue is essential.

Previous research found that citizen journalism complements newspapers by covering more details of a neighborhood (Lacy et al., 2010). This study finds a more complex relationship than the previous literature suggested. First, when a local and environmental issue draws media attention, local/regional professional journalism is more likely to present viewpoint diversity than is citizen journalism. Citizen journalists or USS sites do not increase diverse viewpoints into public representation of the issue.

The absence of local/regional citizen journalism focused on environmental issues could be the main reason. Among all sampled environmental news sites, none of them solely served the area of Alaska, Oregon, or Washington. In the Columbia and Knight databases, only 44 news sites were identified as local/regional citizen journalism sites entirely or partially focused on environmental issues. Among the 44 sites, only one site, *Seattlest.com*, was based in Washington State, but this site does not exist today. Citizen journalism sites are rarely created for local/regional environmental concerns. When an environmentally related event occurs in a region, professional journalists, instead of citizen contributors, provide the major information and viewpoints to satisfy their audience's interests. This finding is consistent with those of previous studies that local media provide different angles about an environmental issue that are absent in prestigious or national media (Feighery, 2011).

Second, even though citizen journalists or USS sites do not contribute to viewpoint diversity, other citizen-involved activities supplement viewpoint diversity of an environmental issue. Grassroots voices and citizen-contributed opinion pieces are positively related to the representation of more opposing and minority viewpoints. In other words, citizens contribute to

diverse viewpoints of the issue through being information sources or submitting opinion pieces to professional or USS news sites.

The second finding also raises questions about what citizen journalism really is and how to study it. As discussed in the literature review, citizen journalism can refer to citizens' partial participation in the creation of news products (such as being an information source) or full participation as the authors of news products (Holt & Karlsson, 2015; Outing, 2005). At the organization level, citizen journalism sites are usually characterized by digital-only distribution, ownership, and the adoption of USS (Lacy et al., 2010; Nee, 2013).

However, this study finds that sampling "citizen journalism" sites is tough due to variations in database definitions of the term. The use of popular databases containing citizen journalism sites does not guarantee that the sample corresponds to the definition of "citizen journalism sites." Take three "citizen journalism sites"—Alaska Dispatch, E&E Publishing, and Grist—for example. They are identified as citizen journalism sites in the Knight and Columbia databases. However, none of the sites is an USS site; only one of them is a non-profit site, and two of them are online-only sites. Also, only two stories out of 44 stories published on these sites were authored by citizen contributors, and the only two citizen-written articles were opinion pieces, not news stories. That is, not only the features of the sites are varied, but also the formats of stories sampled from these sites are not much different from those of non-citizen journalism sites—they contain mostly professional stories and few citizens' opinions.

This finding raises questions about the sampling strategy and definitions of citizen journalism sites, especially when scholars use citizen journalism databases as the sample. This study suggests examining citizen journalism by distinguishing individuals from organizations

and by differentiating popular features of citizen journalism sites instead of assuming that the same features persist in all sites listed in unclearly defined databases.

Environmental news is a useful focus for examining viewpoint diversity because two factors—geographical distance and limited resources in the environmental beat—are distinctive influences on the content. The results suggest that geographical distance to news events influences how diverse viewpoints are presented in local media. The audience's regional interests are consistent with whichever side of the issue's position is more frequently presented in the local media. Grassroots sources, which increase minority viewpoints by supporting environmental sustainability, are not preferred by local journalists because of the absence of an environmental beat in local media (Sachsman et al., 2006). As a result, viewpoint diversity in local media is one-sided, and citizen contribution to local media as information sources is limited in the context of environmental reporting.

CHAPTER 5

CONCLUSIONS

This study uses the hierarchical model of influence on media content to examine the role citizen journalism plays in environmental news, using Shell's Arctic oil drilling as the case study (Shoemaker & Reese, 1991). The empirical data suggest that citizen journalism increases viewpoint diversity in three ways: being an information source, writing opinion pieces, and writing for non-profit media organizations (marginal significance). However, citizen authorship or stories published on USS sites do not add new or alternative viewpoints to the issue discussion. Instead, citizen journalists tend to defend their positions by giving more popular rationales—for example, ecological sustainability. Citizens' work published in news media helps strengthen the popular viewpoints instead of supplementing alternative views into public discussion.

Theoretical Contribution and Implications

The findings provide empirical evidence supporting the hierarchical model in the field of citizen participation in environmental journalism. The influences of two factors—geographical distance and limited resources in the environmental beat—are distinctive to environmental journalism. Citizens' voices expressed by being an information source do increase viewpoint diversity in environmental reporting. However, citizens' contributions do not appear in local news as often as expected. Local media close to the news events were found to be less likely to embrace citizen journalism in this case study. Articles published in Alaska, Oregon, or Washington are more likely professionally-written, in the format of news stories, without USS, distributed both online and off-line, and be on commercial news sites. Professional local media increased content diversity of the environmental issue with little contribution by citizens.

Although specialized environmental reporters are usually absent in local media (Sachsman et al., 2006), this study shows that local media can concentrate their resources on an environmental issue when the geographical distance is close to the event. The findings indicate that the audience's interests (level of social institutions) motivate local media to relocate their resources (level of media routines), and thus increase content diversity about an environmental issue. This current study thus adds to the hierarchical model by explaining the interactive relationship between the level of media routines and social institutions, which are commonly observed in the context of environmental journalism

The findings imply two insights into citizen participation in environmental journalism. First, when local professional media cater to their audience's interest in an environmental issue, voices from minority citizens tend to be lacking. The lack of specialized local environmental journalists may decrease local journalists' effort to cultivate sources (Friedman, 1991). Local professional journalists in Alaska, Oregon, or Washington were found to use fewer grassroots sources, and to favor one side of viewpoint diversity. In other words, the lack of an environmental beat may induce local journalists to present material that is immediately available in their work routine. For example, Washington state-based regional media, residing in a state that leans toward liberal ideology, tends to present opposing viewpoints that criticize the absence of public input in hosting Shell's drilling rigs in Seattle more often than national media. They do not cite minority voices that preresent different positions in the area as often. Similarly, Alaskan regional media, residing in a state that relies economically on crude oil production, avoids presenting views opposing Arctic drilling or discussing the impacts on Alaskan Natives and those economically dependent on a clean environment.

Second, contrary to previous findings (Lacy et al., 2010), citizens' contribution to reporting on environmental issues was not found to be in their local media, but in the media serving the United States and global markets. National and global media news sites were found to be more likely than regional media to publish citizen contributors' articles, and cite grassroots sources. Citizens' voices were most frequently found as sources and in opinion pieces. Those actions increased viewpoint diversity in national and global news sites. More resources available to national and global news media seem explain the finding. Professional sites that incorporate citizen-made news do not do so because it is a cheaper alternative (Deuze et al., 2007). It requires resources to manage the content. The large-scale news media are more likely than local media to be able to afford citizen participation in environmental news.

Other Important Findings

While this study supports some previous findings, it also adds interesting new insights to research on citizen journalism reporting on environmental issues. First, this study provides new empirical evidence to support the argument that source diversity contributes to content diversity. More specifically, the use of corporations or public officials as sources increases alternative views favoring Arctic drilling, while more grassroots sources cited in the news increase the representation of opposing and alternative views. On this environmental issue, different types of sources hold different positions. Any preferences for certain types of sources in the news may lead to biased representation and incomplete information delivery.

Second, this study suggests that citizen contributions as complements of professional journalism should be examined under different levels and features due to unclear definitions and the complexity of the concept. With detailed analysis on several characteristics of citizen journalism, this study argues that citizen journalism complements professional journalists' work

by being information sources and writing opinions, or contributing to news sites that have non-commercial goals—which may help the distribution of alternative viewpoints.

Finally, in the field of environmental journalism, abundant research focuses on the accuracy of neutral scientific knowledge in environmental news (Bell, 1994; Farnsworth & Lichter, 2012). However, this study examines environmental reporting through different lenses—how citizens contribute to the deliberation of environmental issues during decision-making on energy policy. Media content is not only a channel to deliver scientific knowledge, but also a public sphere providing diverse ideas in order to reach public consensus (Schudson, 1982). This study shows that the majority of citizen-involved activities and features—citizen authorship, grassroots sources, USS sites, and non-profit organizations—are more likely to hold the positions of protecting the environment. Thus, the citizen-involved activities contribute to public discussion by strengthening popular viewpoints about the issue.

Practical Contribution and Limitations

These data suggest that professional local news media tends to favor the viewpoint that conforms to their audience's interests. It requires time and other limited resources for local professional journalists to incorporating local citizen journalism. . Social learning about local minority's views is not foreseeable through the use of local news content. Communities should work on collaborating with local media to expand viewpoint diversity in a market. Citizen participation in environmental reporting on national and global news sites can be examples of the collaboration. Details about how communities invite local media to incorporate citizen participation in news-making process and thus benefit decision-making on energy policy warrant future research.

As with all research, this project has limitations. First, caution should be taken in generalizing the results to apply to all environmental issues. Even with a rigorous sampling strategy, the sample in this project is simply one case among all environmental issues. The selected case may present more opposing viewpoints than positive views about Arctic drilling, but the relationships between independent variables—workforce, journalistic formats, media type, information sources, USS sites, mission type, ownership, and community focus—and the presence of opposing minority viewpoints is not expected to differ. The potential bias to generalize the case into other environmental issues would be that the predictors of positive minority viewpoints may differ due to the smaller number of positive viewpoints in this selected topic. Second, there are too few stories authored by citizen journalists, and thus, rare events were observed when the logistic regression model was computed. As a result, models were only performed to compare the use of opposing minority viewpoints between professional and citizen journalists, with the absence of comparing the use of positive minority viewpoints. Finally, viewpoint diversity is only one criterion of information quality. The increased viewpoint diversity from grassroots sources and opinion pieces does not reveal much about other journalism qualities (such as accuracy and objectivity).

APPENDICES

Appendix A

List of Environmental Citizen News Sites/Blogs

Table 25. Local Environmental Citizen News Sites/Blogs.

NO.	Site Name	Description	Site URL	Target Community
L1	A DC Birding Blog	A DC Birding Blog is a solo blog that includes bird sightings reports, educational posts, and commentary on issues of interest to the local birding community.	http://dendroica.blogspot.com/	Washington, D.C.
L2	Ah-Ha Rancho Santa Fe News	Ah-Ha Rancho Santa Fe News, http://ahharsfnews.com/ , is an exciting online media experience dedicated to the culture, economy, politics, environment and lifestyle of Rancho Santa Fe. Our core mission is to serve the region with innovative, participatory journalism promoting conversation that helps us understand, and make the most of the dramatic changes shaping our lives.	http://ahharsfnews.com	Rancho Santa Fe, CA
L3	Appalachian Voices' front porch Blog	We cover the issues, regarding conservation and culture, which are having the most impact on the people of Appalachia.	http://www.appvoices.org/index.php?/frontporch/	The Appalachian Mountain Region
L4	Berkeleyside	It reports the news and covers the extraordinary diversity of people, issues, events, food and environment in this city whose impact reaches far beyond the Bay Area.	http://berkeleyside.com	Berkeley, CA
L5	California Watch	The team at California Watch pursues in-depth, high-impact reporting on issues such as education, public safety, health care and the environment.	http://www.californiawatch.org/	California
L6	Citizen Wausau	Building on the idea of grassroots organization, old town hall meetings and citizen journalism, Citizen Wausau is a web-based environment focused on giving voices to the people of Central Wisconsin. We seek to empower contributors to speak their minds, to create an environment rich in diverse commentary.	http://citizenwausau.com	Wausau, WI
L7	Confessions of a Backdoor Biologist	Amateur birdwatcher and naturalist reports on the local environment and wildlife.	http://okwba.blogspot.com/	Oklahoma
L8	Dakotafire	Dakotafire's alliance of reporters and editors work together to produce in-depth, nationwide coverage of issues vital to the sustainability of the area's rural communities.	http://dakotafire.net	James River Valley of North and South Dakota
L9	ecoRI	Environmental News for Southern New England	http://www.ecori.org/	Providence, RI
L10	GothamGazette.com	Gotham Gazette is a Web site about the issues facing New York City. Coverage, digests and commentary on New York City current affairs and policy, arts, education, environment, and housing; community discussion forums; sub-sites on city government, immigration issues, community gazettes, state government.	http://www.gothamgazette.com	The five boroughs of New York City
L11	Great Lakes Echo	We foster and serve a news community defined by proximity to and interest in the environment of the Great Lakes watershed. We use traditional news reporting methods rooted in accuracy and fairness. We also push the frontiers of journalism to harness the knowledge, interests, skills and energy of that community.	http://greatlakesecho.org	The Great Lakes watershed
L12	Great Lakes Wiki	Binational grassroots reporting of environmental and other issues that affect the Great Lakes. Anyone can post. The site also serves as a publishing platform for students in some journalism or telecommunications classes at Michigan State University.	http://greatlakeswiki.org	The Great Lakes watershed
L13	Green Jobs Philly	Green Jobs Philly News features the greening of Philadelphia's economy. Our home page makes it easy for Philadelphians to offer and request green jobs, green services, green grants and green loans.	http://www.greenjobsphilly.org/news	Philadelphia, PA

Table 25 (cont'd)

NO.	Site Name	Description	Site URL	Target Community
L14	Green Parent Chicago	Green Parent Chicago was founded in 2008 by Christine Escobar as a welcoming harbor for Chicago area parents interested in natural family living and caring for the environment. At Green Parent Chicago we believe natural parenting, green living and environmentalism are all segments of the same continuum. - See more at: http://greenparentchicago.typepad.com/my_weblog/about-us.html#sthash.pAxdjuPb.dpuf	http://www.greenparentchicago.com	Chicago metropolitan area
L15	Greensboro Birds	Birdwatching in the North Carolina Triad. News and insight into the local environment and wildlife through the eyes of an avid birdwatcher.	http://www.greensborobirds.com/	Greensboro, NC
L16	Growth Matters	The official blog of the Triangle Community Coalition reporting on issues of economic growth, development, the environment, and community needs while of interest to local property owners	http://growthmatters.org/	The Triangle, NC
L17	High Country News	Its mission is to inform and inspire people – through in-depth journalism – to act on behalf of the West's diverse natural and human communities.	http://www.hcn.org	Western U.S.
L18	Idaho Conservation League Blog	Blog of the staff of the Idaho Conservation League covering Idaho conservation issues in Idaho, including clean water, wilderness and quality of life. Moved to this new address August 2009 from http://wildidaho.wordpress.com/ .	http://www.idahoconservation.org/icl-community/blog	Idaho
L19	Island Breath: Ea O Ka Aina	Island Breath is an online publication dedicated to people interested in the well being of the island of Kauai. For us sustainability is crucial.	http://www.islandbreath.org	Island of Kauai
L20	Maine Center for Public Interest Reporting	The Maine Center for Public Interest Reporting will keep citizens informed about their government and their public servants through high-quality, independent investigative reporting that is published by media outlets across the state.	http://www.pinetreewatchdog.org/	Maine
L21	Maryland Commons	Having environmental and energy news Maryland Commons covers major issues affecting citizens in Maryland, with special emphasis on public affairs reporting about state government, the state's economy, environment and public education (K-20) education systems. Primary content comes from paid journalists; citizen journalists provide "guest commentaries" in areas where they have depth of knowledge and/or professional expertise. Examples of Maryland Commons guest commentaries from citizen journalists are: Our Manic-Depressive State Budget (http://marylandcommons.com/editions/12/content_items/53); Reforming Elections and Strengthening Democracy in Maryland (http://marylandcommons.com/editions/10/content_items/43)	http://marylandcommons.com	Maryland
L22	MinnPost.com	MinnPost is a nonprofit journalism enterprise that publishes MinnPost.com. Our mission is to provide high-quality journalism for news-intense people who care about Minnesota. Having environmental news.	http://www.minnpost.com	Minnesota
L23	Montana Watchdog	Our mission is to restore oversight of our state governments, to hold politicians and bureaucrats at all levels accountable for their handling of taxpayers' dollars and to promote individual liberty and free markets.	http://www.montanawatchdog.org	Montana
L24	New West Unfiltered	Having energy news Blogs by readers offered by a pro-am hybrid commercial venue offering citJ, commentary, community discussion forum, regular contributors and citizen contributions. "New West is a network of online communities devoted to the culture, economy, politics, environment and overall atmosphere of the Rocky Mountain West."	http://www.newwest.net/	NM, CO, WY, MT, ID

Table 25 (cont'd)

NO.	Site Name	Description	Site URL	Target Community
L25	Orange Politics	Progressive perspectives on Orange County, NC. Mostly politics, elections, campaigns, environment, public safety. Original reporting and research, as well as commentary and advocacy.	http://orangepolitics.org/	Orange County, NC
L26	Philadelphia Citizens Aviation Watch	Site by local watchdog group concerning environmental and noise issues in the neighborhoods surrounding Philadelphia International Airport. Includes some original research and reporting, as well as advocacy.	http://www.phl-caw.org/weblog/blogger.html	Philadelphia metro area (PA and NJ)
L27	PlanCharlotte.org	Our goal at PlanCharlotte.org is to be a citizen resource for exploring problems and finding solutions in land-use planning, neighborhood design, environmental protection and other urban and regional issues.	http://plancharlotte.org	14-county greater Charlotte region
L28	Portland Afoot	For Portland Afoot, it's a new life. And it starts where our last one left off: with a tiny monthly newsmagazine about low-car life in PDX for smartphone and tablet.	http://portlandafoot.org	Portland metro area
L29	Raleigh Eco News	Raleigh Eco News offers environmental news and commentary relevant to residents of Raleigh, N.C. It's an informal site but published by a professional reporter with a master's degree in journalism, so it straddles the dividing line between professional and "citizen" journalism.	http://www.raleigheconews.com	Raleigh, NC
L30	Rhode Island Policy Reporter	News about technical issues of public policy: taxes, housing, economics, state budget, environmental issues and more.	http://whatcheer.net	Rhode Island
L31	Rob's Idaho Perspective	Personal blog of a nature enthusiast occasionally reporting on local issues of conservation, ecology and politics	http://wolf21m.blogspot.com/	Boise, Idaho
L32	Roundrock Journal	A little bit of forest on the edge of the Missouri Ozarks.	http://www.roundrockjournal.com/	Ozarks
L33	Seattlest	One of the Gothamist family of hyperlocal sites. Mostly reviews, entertainment, local culture. Some news and discussion. Core group of contributors (not open for anyone to post)	http://seattlest.com	Greater Seattle, WA
L34	Servicio de Informacion en Español	The mission of Seeding Chicago is to bring you the stories of our metropolitan area's urban farmers and the lessons they're learning in their journeys toward sustainability. SmallBusinessExecutive (SmallBizChicago.com) is a collaborative website full of feature stories, expert columns, events, startup information and discussion on technology, finance, marketing, innovation, human resources, the environment, management, health care, and the economy. It was designed to inform, inspire and connect businesses in Chicago and beyond.	http://ucanr.edu/sites/Spanish/Noticias/	California
L35	SmallBizExecutive	SmallBusinessExecutive (SmallBizChicago.com) is a collaborative website full of feature stories, expert columns, events, startup information and discussion on technology, finance, marketing, innovation, human resources, the environment, management, health care, and the economy. It was designed to inform, inspire and connect businesses in Chicago and beyond.	http://www.smallbizchicago.com	Illinois and occasionally Wisconsin
L36	Summit County Citizen Voice	The Summit County Citizens Voice is a web site dedicated to reporting unfiltered and uncensored news from Summit County and beyond. Including news about climate change.	http://summitcountyvoice.com/	Frisco, CO
L37	Surf City Voice	The purpose of the Surf City Voice is to provide in-depth and honest reporting, analysis and commentary that helps readers to understand water management and governance in southern California. - See more at: http://www.surfcityvoice.org/about/#sthash.x3E78jZb.dpuf	http://www.surfcityvoice.com	southern California water districts, emphasis on Orange County
L38	The CT Mirror	We continue to ramp up our coverage of Connecticut and issues important to our state, as well as to provide more of a platform for readers and decision-makers. Having environmental news.	http://www.ctmirror.org	Connecticut

Table 25 (cont'd)

NO.	Site Name	Description	Site URL	Target Community
L39	The Florida Current	The Current is written for stakeholders in Florida's legislative process. Executive-level legislative issue briefs Interviews with policy makers and key players	http://www.thefloridacurrent.com/	Tallahassee, FL
L40	The Lexington Commons	The Lexington Commons features news and information about politics, the economy, education, culture, youth, housing, health, the environment, and much more. The site offers information specifically about community nonprofit organizations through a "Nonprofit News Network" section. The Lexington Commons also has a "Community Connects Citizens" feature that helps people connect and network.	http://www.kylexingtoncommons.org/	Lexington, KY
L41	The Manomet Current	The Manomet Current is the independent online news source for Manomet and the Pinehills. Locally owned and operated, we're here to keep you informed about what's happening in the community. Having environmental news.	http://www.manometcurrent.com	the village of Manomet and nearby neighborhoods of Plymouth, Massachusetts
L42	Voice of San Diego	We are a public-service, nonprofit news organization that focuses on in-depth and investigative reporting. We cover the issues that are crucial to the region's quality of life: its politics, educational system, environment, housing, economy and more.	http://www.voiceofsandiego.org/	San Diego, CA
L43	VTDigger.org	VTDigger.org is a statewide news website that publishes watchdog reports on state government, politics, consumer affairs, business and public policy. Including energy and environmental news.	http://vtdigger.org	Vermont
L44	Yellowstone Gate	Yellowstone Gate is an independent, online news site covering life in and around Yellowstone and Grand Teton national parks. Our mission is to offer original reporting, insight and commentary on the critical common issues facing the parks and their gateway communities, including Cody, Wyo.; Cooke City, Mont.; Gardiner, Mont.; Jackson, Wyo.; and West Yellowstone, Mont.	http://yellowstonegate.com	Yellowstone and Grand Teton national parks and their five small gateway towns in Montana and Wyoming

Table 26. National Environmental Citizen News Sites/Blogs

NO.	Site Name	Description	Site URL
NN1	[people. power. media]	[people. power. media] broadcasts efforts and perspectives from marginalized communities where grassroots organizations are working to change public policy. We currently focus on land use issues.	http://peoplepowermedia.net
NN2	Alaska Dispatch	From political corruption to climate change to rural Alaska to the rise of Sarah Palin, Alaska media has struggled to cover stories of importance not only to Alaskans but to the rest of the nation. Alaska Dispatch, Alaska's online-only news site, is devoted to filling this journalism void. Whether reporting on powerful oil companies or on residents who live far from the urban centers where decisions are made, Alaska Dispatch's goal is to take an unflinching look at the state, from its massive riches to its abject poverty, and tell these stories to Alaskans and to the world.	http://www.adn.com/
NN3	AnimalTourism	AnimalTourism.com shows people where they can go to see animals in the wild or at sanctuaries. We cover animal news and the general topic of how wildlife watchers outnumber and outspend hunters, but often get overlooked in public policy.	http://www.animaltourism.com

Table 26 (cont'd)

NO.	Site Name	Description	Site URL
NN4	DeSmogBlog	The DeSmogBlog Project began in January 2006 and quickly became the world's number one source for accurate, fact based information regarding global warming misinformation campaigns.	http://www.desmogblog.com/
NN5	E&E Publishing	Environment & Energy Publishing (E&E) is the leading source for comprehensive, daily coverage of environmental and energy policy and markets.	http://www.eenews.net/
NN6	Go Green Nation	GoGreenNation provides environmental news and resources for building sustainable communities. I'm starting it for my local community, but I hope that other communities will want to create local pages on the site as well. I invite local contributions.	http://www.gogreennation.org
NN7	Grist	Grist is a source of intelligent, irreverent environmental news and commentary that's been around since 1999, when the internet was made of rubber bands. We cover climate, energy, food, cities, politics, business, green living, and the occasional adorable baby animal. Each day, we use our Clarity-o-Meter to point our readers to the news that matters most, and to translate wonky issues into stories that make sense.	http://grist.org/
NN8	InsideClimate News	InsideClimate News is a Pulitzer prize-winning, non-profit, non-partisan news organization that covers clean energy, carbon energy, nuclear energy and environmental science—plus the territory in between where law, policy and public opinion are shaped. Our mission is to produce clear, objective stories that give the public and decision-makers the information they need to navigate the heat and emotion of climate and energy debates.	http://insideclimatenews.org/
NN9	Investigative Reporting Workshop	The Workshop publishes in-depth stories at investativereportingworkshop.org about government and corporate accountability, ranging widely from the environment and health to national security and the economy.	http://investativereportingworkshop.org/
NN10	Kauai.net	No longer a news site, domain has been purchased. Used to have analysis and reporting on primary public records obtained through Hawaii Open Records laws. Hyperlocal forum, very news focused, some citJ.	http://kauai.net
NN11	LiveScience	Having environmental news	http://www.livescience.com/
NN12	LocallyGrownNews.com	The best in science, technology, health, and environmental reporting.	http://www.locallygrownnews.com
NN13	New America Media	LocallyGrownNews.com is an online community designed to foster the eating locally movement. Our mission is to generate conversation around sustainable, healthy lifestyles.	http://www.newamericamedia.org/
NN14	New American Journal	NAM produces, aggregates and disseminates multimedia content and services for and from the youth and ethnic media sectors.	http://www.newamericanjournal.net/
NN15	Salon	Independent Mobile Journalism (IndyMoJo): Going After Big News, Covering Public Affairs With the Accuracy Google Demands.	http://www.salon.com/
NN16	Streetsblog	Having environmental news	http://www.streetsblog.org/
NN17	The Center for Public Integrity/iwatchnews.org	Salon.com covers breaking news, politics, culture, technology and entertainment through investigative reporting, fearless commentary and criticism, and provocative personal essays. Having sustainability news.	http://iwatchnews.org

Table 26 (cont'd)

NO.	Site Name	Description	Site URL
NN18	The Ester Republic	One-person blog covering a wide variety of topics, including Ester events, politics, local agriculture, alternative energy and design, publishing, land planning, health care, the local library, and personal events in the life of the author.	http://esterrepublic.blogspot.com/
NN19	The Huffington Post	Having environmental news.	http://www.huffingtonpost.com/
NN20	The Locust Fork News-Journal	Having environmental news.	http://blog.locustfork.net/
NN21	The Schuster Institute for Investigative Journalism at Brandeis University	As a research university, Brandeis is dedicated to the advancement of the humanities, arts and social, natural and physical sciences. As a liberal arts college, Brandeis affirms the importance of a broad and critical education in enriching the lives of students and preparing them for full participation in a changing society, capable of promoting their own welfare, yet remaining deeply concerned about the welfare of others. Having environmental news.	http://www.brandeis.edu/investigate/
NN22	Yale Environment 360	<i>Yale Environment 360</i> is an online magazine offering opinion, analysis, reporting and debate on global environmental issues. We feature original articles by scientists, journalists, environmentalists, academics, policy makers, and business people, as well as multimedia content and a daily digest of major environmental news. We post news and information gathered from all over the "Range of Light" - north and south, east and west - plus California, national and world news.	http://e360.yale.edu/
NN23	YubaNet	Our newsroom overlooks the Yuba River just outside historic Nevada City, California, hence our name. Of course, YubaNet.com also covers local news for our hometown readers here in Nevada City, Grass Valley, and Truckee - the three biggest towns in Nevada County, California. Having environmental news.	http://yubanet.com

Appendix B

Coding Protocol: Identifying Relevant Stories of Shell's Arctic Oil Drilling

Conceptual Definition

Shell's Arctic oil drilling. The exploration of the Arctic for oil became a more feasible plan by recent technological developments and relatively high oil prices. The Royal Dutch Shell Company, commonly known as Shell, has started the Arctic oil drilling since 2012.

October 11, 2012, Dep. Secretary of the Department of the Interior David Hayes stated that support for the permitting process for Arctic offshore petroleum drilling will continue if President Obama stays in office. In September 2015, however, Shell announced that the plan was abandoned due to disappointing quantities of oil and gas in the area.

The timeline of the Arctic oil drilling:

- ☐ July 2012: Shell's offshore oil spill response equipment repeatedly fails government tests.
- ☐ September 2012: Pack ice forces Shell to abandon drilling for year.
- ☐ 2013: Drilling suspended for year as government reviews Shell's equipment.
- ☐ 2014: Drilling suspended as government reviews Arctic drilling.
- ☐ April 2015: Protests begin in Seattle to block Shell offshore drilling rigs that are planning to head to Alaska.
- ☐ June 2015: Two Shell Oil drilling rigs — the Polar Explorer & Noble Discover — leave Seattle.

Coding Procedure

Training. The coder(s) will be gathered and sit together face-to-face. The trainer will first explain the goal of the research. Next, coders will be asked to read through the protocol, and the trainer will explain the protocol in details. Meanwhile, coders are encouraged to ask questions

about the protocol. Discussion about the protocol definitions is also encouraged. Then, coders are asked to independently practice on a chosen news story, and to apply the protocol in the coding sheet. The completed code sheets will be compared and discussed to find out more errors and inconsistency of the protocol. The independent coding will be repeated until a consensus is found among coders.

Reliability assessment. Each news story in the sample will be assigned an ID number. An online random number generator – RANDOM.ORG – will be used to select required numbers. This study will adopt Riffe, Lacy and Fico’s (2005) instruction that indicates the required number of content units for reliability test (pp. 146-147). According to the instruction, this study may use 85 news stories for testing at a 95% level of probability.

The reliability assessment should meet three main standards. First, two or more coders who did not create the protocol are required to assess reliability. Second, the coders need to complete the coding independently within a limited time. In other words, coders should not discuss or talk about the content when coding, and each coder will be provided identical time period to complete the test.

To analyze inter-coder reliability, Krippendorff’s alpha will be applied to measure the agreement achieved among coders for the variables: workforce, information source, USS sites, mission types and viewpoint diversity. This study will employ a standard Alpha of .80 or higher as a “pass” for reliability test.

Coding. The maximum number of hours of coding permitted is four hours per day to avoid fatigue during coding. The software used for the content analysis is Survey Gizmo. Coders will be trained filling in the blank in the form created by the researcher.

Operational Definitions of Major Variables

V0=Coder ID=unique identification of each coder begins with 1

V1=Story ID=unique identification number of story begins with the story ID, the published date, the brief address of the online news site and the shortened headline of the article

V8=Story relevance=Identify if the article is relevant to Shell's Arctic oil drilling.

- If the article is only about Russia's oil drilling or Chevron, Exxon Mobil and BP's Canadian Arctic exploration, it is not a relevant story of this study.
- If the article is about the Alaska North Slope or the Arctic National Wildlife Refuge, it is not a relevant story of the offshore Arctic oil drilling.
- If the article is about general Arctic oil drilling without specifying any regions, it is a relevant story.
- The protest in Seattle is a relevant story.
- If no relevant content is found from the headline to the 5th paragraph, code the story as 0=Not relevant.
- Code the story as "relevant," if the story contains more than one paragraphs and it is a news video.

0=Not relevant

1=Relevant

Appendix C

Final Exact-Word Search Terms

"Arctic Drill" OR
"Arctic Drilling" OR
"Arctic Energy" OR
"Arctic from Oil Drilling" OR
"Arctic from Oil Spills" OR
"Arctic Ocean Drilling" OR
"Arctic Ocean off Limits to Drilling" OR
"Arctic off Limits to Drilling" OR
"Arctic Offshore Drilling" OR
"Arctic Offshore Oil Drilling" OR
"Arctic Oil" OR
"Arctic Oil Drilling" OR
"Arctic Sanctuary Campaign" OR
"Arctic Waters off-limits to Oil" OR
"Beaufort and Chukchi Seas" OR
"Beaufort Lease Sale" OR
"Chukchi and Beaufort Seas" OR
"Crude in the Arctic" OR
"Drill in Alaskan Waters" OR
"Drill in Arctic" OR
"Drill in the Arctic" OR
"Drilling for Oil in the Arctic" OR
"Drilling in the Arctic" OR
"Drilling in the Beaufort Sea" OR
"Drilling in the Fragile Arctic" OR
"Drilling Program in the Arctic" OR
"Drill off Alaska's Coast" OR
"Drill Offshore in the Arctic" OR

"Drill Offshore in Vulnerable Arctic" OR
"Drill Offshore Wells off Alaska " OR
"Drilling in Arctic" OR
"Drilling in the Arctic" OR
"Drilling Operations in the Arctic" OR
"Five-Year Oil-Leasing Plan" OR
"Five-Year Plan for Offshore Operations" OR
"Five-year Plan for Oil and Gas" OR
"Greenpeace Campaign to Preserve the Arctic " OR
"Kulluk" OR
"Lease Sales in the Chukchi Sea" OR
"Noble Discoverer" OR
"Oil Exploration in the Arctic" OR
"Oil Exploration in US Arctic" OR
"Oil in the Chukchi Sea" OR
"Oil in the Arctic" OR
"Seattle Kayaktivists Protest" OR
"Shell Arctic Oil" OR
"Shell Icebreaker" OR
"Shell in Alaskan Waters" OR
"Shell Oil Icebreaker" OR
"Stop Shell, Save the Arctic"

Appendix D

The First-Stage Coding Protocol: Content-related Variables

Conceptual Definitions of the Variables

Citizen contributors. The word “citizen” distinguishes from professional journalists by the potential of adopting journalistic norms. Citizen contributors do not participate in newsmaking work full-time. Also, citizen journalists do not have professional journalism training either at school or at work place.

Information sources. A news source is conceptually defined as individuals, organizations or documents who or which provide information and are presented in news stories (Grimm, 2009). A source is a person, an organization, or a document cited as an information provider in news stories. A source should be mentioned with words that indicate a direct communication with reporters, SUCH AS “said,” “affirmed,” “told,” or “according to.” If a source is a document, it should be mentioned with words that indicate the content of the document is used as part of a news article, SUCH AS “notes,” “concludes,” “finds,” “points out,” or “acknowledges.” The same rule applied when an organization is cited in a news story.

Journalistic formats. News stories are articles reporting on a news event or presenting facts, usually through information sources, without purposefully inserting personal opinions. Opinion pieces are articles advocating personal viewpoints or judgments on public issues.

Viewpoints. A viewpoint presents a person’s perspective on an issue. This study defines viewpoint as a position towards an issue and the rationale supporting the position in the news.

Coding Procedure

Training. The coder(s) will be gathered and sit together face-to-face. The trainer will first explain the goal of the research. Next, coders will be asked to read through the protocol, and the trainer will explain the protocol in details. Meanwhile, coders are encouraged to ask questions about the protocol. Discussion about the protocol definitions is also encouraged. Then, coders are asked to independently practice on a chosen news story, and to apply the protocol in the coding sheet. The completed code sheets will be compared and discussed to find out more errors and inconsistency of the protocol. The independent coding will be repeated until a consensus is found among coders.

Reliability assessment. Each news story in the sample will be assigned an ID number. An online random number generator – RANDOM.ORG – will be used to select required numbers. This study will randomly select 66 stories for reliability test (Gwet, 2008). If the 66 articles do not include all events of all variables, this study will sample 50% more articles until all events are included in the test.

The reliability assessment should meet three main standards. First, two or more coders who did not create the protocol are required to assess reliability. Second, the coders need to complete the coding independently within a limited time. In other words, coders should not discuss or talk about the content when coding, and each coder will be provided identical time period to complete the test.

To analyze inter-coder reliability, the AC₁ coefficients will be applied to measure the agreement achieved among coders for the variables: workforce, information source, issue position, and rationales. This study will employ a standard Alpha of .80 or higher as a “pass” for reliability test.

Coding. The maximum number of hours of coding permitted is four hours per day to avoid fatigue during coding. The software used for the content analysis is Survey Gizmo. Coders will be trained filling in the blank in the form created by the researcher.

Operational Definitions of Major Variables

V0=Coder ID=unique identification of each coder begins with 1

V1=Story ID=unique identification number of story begins with the story ID, published date, name of the news outlet, and the shortened headline of the article

V2=Reporter Type: Here are the instructions to find out reporters' information:

- 1) check the byline to see if the article is authored by staff writer (sometimes called science writer, business writer...etc.);
- 2) check the end of each article to see if any author's information is given;
- 3) check if the author's email address contains the domain name of the news organization (a regular reporter);
- 4) if information is not found through the byline or the end of an article, click on the name of the reporter (if a hyperlink is applied). Or, go to "About us" or "Contact" to see if the name of the author is listed on the news site;
- 5) if no information is found, search the names of the author and the media outlet on Google Search. A professional journalist's information can be usually found on Wikipedia, LinkedIn or other news sites.

1=Professional journalists (including staff writers, editors, freelance reporters, former journalists, journalism faculty or students)

2=citizen writers/bloggers (Having a job title that is not a journalist)

3=wire services (Associated Press or AP, Reuters, Press Association, Agence France Presse) or all other syndicated news service, such as New York Times, Washington Post, Los Angeles Times, etc.

4=Can't tell (No reporter name; no organization name)

V3=Story types: to decide if an article a news story or opinion piece, check:

- 1) if the article was posted in an op-ed, column, letter to the editor, opinion...etc., it is an opinion piece.
- 2) if the author gives issue positions or rationales in the article. If the author does, the article is coded as an opinion piece.

1=news stories (No author's viewpoint shown)

2=opinion pieces (presenting author's viewpoints in the article, or op-ed, column, letter to the editor...etc.)

**** If you have hard time to decide the story type, check if the author used **THE FIRST PERSON** to write. If so, it is an **opinion** piece. For example, "[t]oday's arguments being made by the offshore oil industry..... remind me of" This style is coded as an opinion piece.**

V4=Issue Position: An issue position is an explicit statement about whether or not drilling should take place in the artic. The position statement can be about an entity involved in the controversy (e.g., Greenpeace, Shell, an NGO, etc.), about an action taken by one of the entities, or about the consequences of the drilling.

An issue position needs to be connected to the source who claims it. A source's position(s) can be one statement or multiple statements presented in one or multiple paragraphs.

Coding instructions:

- 1) Go to the first paragraph of an article.
- 2) Identify an issue position in a paragraph first.
- 3) Make notes on positive, opposing, or neutral position.
- 4) Go to the next paragraph and repeat the same procedure to identify an issue position.

Codes:

1=positive view: if all viewpoints or a preference from a source showed favoring
Arctic oil drilling;

2=opposing view: if all viewpoints or a preference from a source showed opposing
Arctic oil drilling;

3=neutral: if both positive and opposing views are shown from the same source
and no preference can be identified;

****If the headlines clearly identified the topic of the Arctic oil drilling, the positions will be coded within the context of the article. Otherwise, positions will only be coded within the context of a paragraph.**

**** If the source set a higher standard for permitting the Arctic oil drilling in order to minimize the activities, it will not be coded as an issue position.**

Examples: The following are examples that will help you identify an issue position.

- Taking positions on the action of (stopping) the Arctic oil drilling

For example, “Greenpeace is against drilling for oil in the Arctic region” –**against the
action**

“Shell engineers have said they believe the company should be held to the less rigorous standards for mobile offshore drilling units” – **against the action of restricting oil drilling**

- Intent to or act on the Arctic oil drilling:

For example, “Shell has also been working to get their exploratory drilling plans in the Chukchi and Beaufort Seas north of Alaska approved for the 2012 summer season”

- Intent to or act on stopping or delaying the Arctic oil drilling:

For example, “...an environmental NGO, filed another lawsuit against the US Environmental Protection Agency (EPA) on behalf on several interest groups, challenging the permits acquired by Shell;”

“Protesting Arctic oil drilling;”

“Greenpeace has launched the ‘Save the Artic’ movement;”

“Environmental groups continue to urge the Obama Administration to delay or stop Arctic drilling by Shell or others;”

- Actions showing **ASSISTING**/trust/question the Arctic oil drilling, including **Authorizing Oil Leasing.**

NOTE: If the assistance of Arctic oil drilling is identified, it **Must Be Specifically Served for The Purpose of Arctic Oil Drilling.**

- Supporting or criticizing an entity who intends to act on or support/stop Arctic oil drilling.

For example, “Greenpeace slammed oil giant Shell...” – **criticize an entity who intends to act on oil drilling**

- Arguing about a claim that supports/criticizes Arctic oil drilling.

For example, “The activist group called Shell’s claims that they were using cutting-edge technology in their Arctic operation ‘nonsense’” – **argue about a claim that supports oil drilling**

- Arguing about **the Consequences** of the Arctic oil drilling.

For example, “drilling would create more than a million jobs.”
 “the potential for catastrophic spills”

V5=Information Source

Instructions:

- 1) Go to the first position identified in an article.
- 2) Identify the information source. A source is a person/organization/document cited as an information provider in news stories. Number the source who gave the first position as source 1.
- 3) Mark the position of the first source as position 1.
- 4) Code the source by the type of the source.
- 5) Go to the next paragraph and check if any position has been identified.
- 6) If a position has been identified, find the source of the second position.
- 7) Do not assign a new number to the same source. For example, if the same source has been identified in the first paragraph, mark the source with the same number (such as source 1).
- 8) Code the type of the source.
- 9) Mark the position according to the number of the source.

10) Go to the next paragraph and repeat numbering the source, position, and coding its type.

11) The maximum number of information source coded in one story is 10.

Types of sources: The priority of categorizing sources is organization > person or organization > document. For example, if a scientist cited in a story is from an environmental group, NRDC, this source is categorized into “Environmental Groups” instead of “Scientific Sources.” Take another example, if statistical data are offered by NASA, this source is classified into “Public Institutions” instead of “Scientific Sources.”

V510=Scientific source

A person: called a scientist, researcher, scholar, professor or an author of an academic paper

An organization: a university, IPCC, or a research institution

A document: conference proceedings, academic journals, statistical data, scientific report

V511=Corporations and business: including private and public companies listed in the following web pages and trade associations.

Private companies: Check if the company listed on:

http://www.forbes.com/largest-private-companies/list/#page:1_sort:0_direction:asc_search:

Public companies: Check if the company listed in American stock market. Go to

YAHOO!FINANCE to check

(http://finance.yahoo.com/;_ylt=AkJHX5YnuPSE6r8fgWCIWFiXgfME).

V512=Politics and public policy:

- 1) Public officials are those who hold legislative, administrative, or judicial positions with official authority, whether appointed or elected. Examples of their organizations include local governments, state governments, federal governments, city councils, county commissions, Congress, Senate, House of Representatives, the Supreme Court...etc.
- 2) Political parties, former public officials or regulators, candidates of public elections
- 3) International Units, such as the United Nations, the World Bank Group, other international political units (such as European Union)
- 4) Think-Tanks

**** The government of a city or a town is a difference source from a tribal government of the same place.**

V513=Media: people or organizations providing information as jobs or products, such as journalists, book writers, newspapers...etc.

Grassroots

V520=Protestors

V521=Small businesses (local retailers, farmers...)

V522=Environmental groups: Check online description. Groups advocate environmental actions, global warming, clean energy, conservation, preventing pollution, environmental sustainability, etc.

V523=Non-environmental groups: Other advocacy groups

V524=All other individuals

V530=All others

** The author of a document or a person spoke for the document, the person and the document will be coded as the **same source**. Similarly, if a person (a spokesperson) represented an organization (being clearly pointed out by the reporter), the spokesperson and the organization will be coded as the **same source**.

V6=Rationales: A sentence gives interpretations, reasons or evidence to support an issue position. For example,

“...because it is impossible to sufficiently clean up potential oil spills;”

“Greenpeace’s claims pertain to the lack of sufficient field-testing of a piece of apparatus...”

“They argue that the area’s rich oil reserves are the only to meet the world’s rising fuel needs.”

If a source or author claims more than one type of rationales for his/her position, choose all that apply.

V610=Market performance: argue on the price or market value of the Arctic oil.

For example, “the expensive arctic oil drilling is not quite favorable with low oil prices.”

V611=Technical efficiency: argue on the technological potentials, abilities and safety to drill in the Arctic. For example, “Arctic oil drilling is not necessary because technological development allows us to move towards renewable

energy.” “The equipment of the Arctic oil drilling was not safe.”

V612=Civic equality: argue on the legal process, equality and protection of civil rights. For example, “Shell oil rigs can’t use Terminal 5 without a new permit under the State Environmental Policy Act.”

V613=Inspirational expression: argue through personal passion, emotion or creativity towards the Arctic oil drilling and its relevant actors. For example, “the Arctic oil drilling could destroy the Inupiat’s culture and age-old tradition.”

V614=Moral principles: argue social or environmental justice or the firm’s social responsibilities. For example, “the oil companies cannot trigger global warming and melting Arctic, and then go for drilling in this area.”

** Using the word “**irresponsible**.”

** Blaming the oil company who **made profits out of disasters**.

V615=Popularity: argue through public agreement. For example, “the majority of Americans (do not) support the Arctic oil drilling.”

V616=Ecological sustainability: consider environmental consequences, protecting environmental resources and the attachments to nature. For example, “Arctic oil drilling imposes extensive damages to the environment due to the potential blowout or large oil spill;” “the Arctic oil drilling should be

stopped to avoid climate chaos;” “Alaska oil is the most environmentally friendly oil compared to oil derived from fracking.”

V617=Rationale not found

** **RISKS** are **NOT** coded as any types of rationales, unless the article specifically points out the risks of (the environment, profits, safety...).

** **A GREAT AMOUNT OF OIL** could be produced is coded as 610 and 611.

** **ENERGY SECURITY** is coded as 610 & 611.

** **Voting** = 612 & 615

** **Energy economy** = 610 & 611

** **Protect the Arctic** = 616

Appendix E

The Second-Stage Coding Protocol: Website-related Variables

Conceptual Definitions of the Variables

Journalistic formats. News stories are articles reporting on a news event or presenting facts, usually through information sources, without purposefully inserting personal opinions.

Opinion pieces are articles advocating personal viewpoints or judgments on public issues.

USS news sites. News websites in which the user-submitted stories are important content on the site.

Environmental news sites. News sites/blogs state the mission of environmental sustainability, conservation, clean energy, mitigating or adapting to climate change, preventing pollution, green life, etc.

Coding Procedure

Training. The coder(s) will be gathered and sit together face-to-face. The trainer will first explain the goal of the research. Next, coders will be asked to read through the protocol, and the trainer will explain the protocol in details. Meanwhile, coders are encouraged to ask questions about the protocol. Discussion about the protocol definitions is also encouraged. Then, coders are asked to independently practice on a chosen news story, and to apply the protocol in the coding sheet. The completed code sheets will be compared and discussed to find out more errors and inconsistency of the protocol. The independent coding will be repeated until a consensus is found among coders.

Reliability assessment. Each news story in the sample will be assigned an ID number. An online random number generator – RANDOM.ORG – will be used to select required numbers. This study will randomly select 85 stories for reliability test (Gwet, 2008). If the 85 articles do

not include all events of all variables, this study will sample 50% more articles until all events are included in the test.

The reliability assessment should meet three main standards. First, two or more coders who did not create the protocol are required to assess reliability. Second, the coders need to complete the coding independently within a limited time. In other words, coders should not discuss or talk about the content when coding, and each coder will be provided identical time period to complete the test.

To analyze inter-coder reliability, the AC_1 coefficients will be applied to measure the agreement achieved among coders for the variables: journalistic formats, USS sites, and mission type. This study will employ a standard Alpha of .80 or higher as a “pass” for reliability test.

Coding. The maximum number of hours of coding permitted is four hours per day to avoid fatigue during coding. The software used for the content analysis is Survey Gizmo. Coders will be trained filling in the blank in the form created by the researcher.

Operational Definitions of Variables

V0=Coder ID=unique identification of each coder begins with 1

V1=Story ID=unique identification number of story begins with the story ID, published date, name of the news outlet, and the shortened headline of the article

V2=Story types: to decide if an article a news story or opinion piece, check (please follow the order below):

- 1) the URL.
- 2) if the article was posted in an op-ed, **COLUMN**, letter to the editor, opinion...etc., it is an opinion piece.

- 3) Read the first two paragraphs. If the story is about an event **OLDER THAN THREE DAYS** (including last week, last month...) without any updated information, code this story as an opinion piece. Weekly news briefs are not determined under this rule.
- 4) Read the first two and the last two paragraphs. If the author used the first person or the second person, it is an opinion piece.
- 5) Read the first two and the last two paragraphs. If the author did not provide any personal comments, it is a news story.

** A blog article can be a news story or an opinion piece.

** The number of sources in a news story is varied, from 0 to many. It cannot be the standard to decide the story type.

** A piece of work containing only a reporter's questions and the interviewee's answers is coded as an opinion piece.

** **NEWS BRIEFS** are coded as news stories.

0=news stories

1=opinion pieces

V3=Mission: Go to "About us" or "Mission" of a news site to see if its mission includes any of the following descriptions: environmental sustainability, conservation, clean energy, mitigating or adapting to climate change, preventing pollution, green life, etc.

** If there is other mission prior to environmental concerns, such as economic development, business, technology, this is NOT an environmental site.

1=environmental

2=Others

V4=USS sites: go to “About us” (first), “Contact” (second) on the site. The site is coded as USS site, if any one of the following conditions is satisfied:

- 1) It invites news users to submit NEWS STORIES or STORY PITCH or ~~FREELANCE WORK~~ to the site (Note: not tips, opinions, photos or videos...etc.);
- 2) it points out that news stories, partially or all, come from guest contributors (citizens, professionals, policy makers, scientists, experts, anyone other than professional journalists);
- 3) it contains a link or email address to submit NEWS STORIES or PITCH or ~~FREELANCE WORK~~;
- 4) if it is a personal blog, check if the blogger a professional journalist, former journalist, journalism faculty or student. If not, this is a USS site.

1=a USS site

0=not a USS site

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