Adding Insult to Industry: Alabamian Newspaper Framing of Tennessee River Pollution

by

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ABSTRACT

Media coverage of environmental topics typically reflects the environmental friendliness of the intended audience. When local media covers environmental problems in a historically industrial, non-environmental area, the media must frame the issue in a manner that connects that audience with the problem. In the Tennessee Valley in North Alabama, the environmental problem of river pollution has been in the news in recent years. This research utilizes frame analysis through a content analysis of newspaper articles about river pollution published in Alabama between 2010 and 2018 to determine if the media successfully framed the pollution as an environmental problem. The results of the content analysis indicate that the local media successfully framed the pollution as an environmental problem.

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DEDICATION

To my grandfathers, James Arnold Currier, and Glen Allen Keenon,

for being unending springs of inspiration and motivation.

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LIST OF ABBREVIATIONS

ADEM – Alabama Department of Environmental Management

CSA – Confederate States of America

DWHA – Drinking Water Health Advisory

EPA – Environmental Protection Agency

PFASs – perfluoroalkyl and polyfluoroalkyl substances

PFCs – perfluorinated chemicals

PFOA – perfluorooctanoic acid

PFOS – perfluorooctanesulfonic acid

TRI – Toxic Release Inventory

TVA – Tennessee Valley Authority

UCMR3 – The third Unregulated Contaminant Monitoring Rule

USD – United States' Dollar

CHAPTER 1: INTRODUCTION

Environmental degradation is a commonplace topic in media coverage, generally discussed as a global issue (Corbett 1993). A globally-evident but locally-experienced form of environmental damage is pollution, defined as "the destruction or impairment of a natural environment's purity by contaminants" (Barnes-Svarney 1995:493). Pollution across the globe poses serious threats to human and ecological health from air, land, and water contamination, especially near industrial locations (Barnes-Svarney 1995; Bach et al. 2017; Hansen et al. 2002; Newton et al. 2017). While pollution in industrial areas may be reported worldwide, the local media is more likely to reflect the feelings of those who live nearby (Corbett 1993; Hannigan 2014). If these areas are typically not environmentally-inclined, the media is not likely to jump aboard an environmental bandwagon, since its audience would not be interested. However, when environmental problems begin to threaten deeply-rooted beliefs or ideologies in this type of area, the media and locals generally become environmentally concerned, even in areas that have been skeptical or combative to environmental concern in the past (Hannigan 2014; Séguin, Pelletier, and Hunsley 1998).

The present research focuses on one such locale: The Tennessee Valley, the area in North Alabama surrounding the Tennessee River, a place rich in industry but historically devoid of intensive environmental care. In recent years,

the river's chemical pollution has been discussed in state and local news, as many residents are worried about what is happening to their river.

This research seeks to widen the small body of knowledge regarding the media framing of river pollution in the southeastern United States by exploring newspaper articles on the pollution of the Tennessee River published in Alabama between 2010 and 2018. These newspaper articles are expected to reflect the attitudes that the residents of the affected areas carry towards the Tennessee River and the local interpretation of its pollution, making the articles an insightful source of information to gauge local priorities and perceptions of the area's environmental problems (Corbett 1993; Hannigan 2014).

CHAPTER 2: CONCEPTUAL FRAMEWORK

Theoretical Perspective

This research utilizes Goffmanian frame analysis in order to distinguish if the local media framed the pollution of the Tennessee River in a manner that successfully presented the pollution as an environmental problem by establishing the pollution as a threat to locals' priorities.

Erving Goffman, in his book *Frame Analysis: An Essay on the Organization of Experience*, presents the concept of *frames*, ideological structures used in society to organize ideas, understand experiences, and guide actions (1974). Frames also help individuals to solve problems and derive subjective meanings and importance during social occurrences, due to frames being mental schema crafted from prior experience and previously-encountered social expectations of behavior (Branaman 1997). For example, a professional baseball player views the Great American Pastime as a career instead of a pastime and trains and plays instead of working a desk job, while an office worker views playing in the company baseball league to be a recess from work. Both individuals work, but for one, the work of the other is a pastime, perhaps because there is no pay or because it is fun. This work/pastime differentiation of the same activity is due to the frames surrounding what is expected out of work or a pastime.

Frames go beyond the simple iteration of an idea by "suggesting what is at

issue" through the act of framing (Gamson and Modigliani 1989:57). The process of framing is done when an information outlet – be it news media, a political group, or a sole person – creates or interprets an issue to others (Nelson, Oxley, and Clawson 1997). This creation or interpretation is accomplished through diction, metaphorical usage, references to examples in the past, imagery, and appeals to reason or morality through analyzing causes or effects, as well as the choice of which elements of a topic to discuss (Hannigan 2014). Entman described framing as the selection of "some aspects of a perceived reality" and promoting them as "more salient in a communicating text," in order to push "a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (1993:52).

For example, say there were an economic tailspin on Wall Street, and one newspaper published an article entitled "Stock Market Crashes!" while another covered the same story with the headline "Some Economic Problems Predicted," and a third did not cover the story at all. Readers of the first newspaper will be much more likely to panic about the financial state than readers of the latter two. Further, readers of the second will probably be more concerned than readers of the third. This is due to the framing of the issue as an issue through diction and coverage. The use of "stock market" indicates the large-scale economic problem and "crashes" is a fear-inducing verb followed by an exclamation point, indicating heightened emotions, while the second headline is altogether vague and uncertain.

Regarding coverage, the fact that one paper did not cover a potential global economic disaster means perhaps the editors are blissfully unaware of current events, they do not view an economic plummet as newsworthy, or they do not want their readers to panic.

While frames assist in explaining social action, Goffman asserts that frames are not an explanation for social structure, rather the analysis of frames is an essential tool to understand social experience (Branaman 1997; Goffman 1974). *Frame analysis* is a means of inquiry that examines the frames created by society to organize experiences. Simply put, this analysis is done by inspecting the manner in which a topic is framed through the wording, syntax, or overall presentation used. In this research, the frame analysis is done through a content analysis, exploring newspaper media's framing of river pollution.

Media framing of environmental problems

Media framing is critical in the process of spreading information to the general audience, and there is no exception when it comes to environmental problems (Hannigan 2014). Since consumers of news media are not merely absorbing the news but instead interpret for themselves what is being presented, for an environmental problem to be interpreted as a threat by the audience, the media must frame it correctly (Hannigan 2014).

Successful framing of environmental problems

Solesbury (1976) delineates three tests that environmental issues should

pass in order to be legitimated in the media as a problem: garner attention, claim legitimacy, and stir action. These align with the steps necessary to successful media framing of an environmental problem as proposed by environmental sociologist John Hannigan (2014), which can be consolidated into the following:

(1) Environmental problems must be presented with scientific backing.

(2) The problem's presentation must be attention-grabbing.

(3) The benefits of solving the problem must be discussed.

For environmental issues, media frames carry a great significance, as the awareness of the public towards a problem is an essential step to solving the problem, yet the environment can only speak through those who pay attention to it. This leads scientists and locals with regular work or recreation in nature to likely be the first to reach out to the media about an environmental problem "because they pick up early environmental warning signals such as reproductive problems in livestock or mutations in fish" (Hannigan 2014:57). In fact, in many cases, the construction of an environmental problem is comprised greatly of locals' experiences and testimony alongside scientific evidence (Gustafsson 2011). Therefore, if news media wishes to frame an environmental problem as a problem, it must combine science and local knowledge.

However, environmental problems are easily overlooked or contested by those not personally experiencing or researching their effects. Environmental issues are highly unlikely to gain grounds in moral or legal arguments until fully

rooted in scientific authority (Hannigan 2014). Therefore, once an environmental issue is discovered or backed by scientific evidence, the scientists must go public, and the media's job is to spread this information. In order to publish an environmental problem with scientific backing, the media must present the issue in an objective yet persuasive manner: using definitions, estimations, quotations from scientific and local sources, and/or linguistic or visual imagery that entices action or response from the audience (Hannigan 2014). These rhetorical devices are useful for media portrayal of scientific evidence and – if framing an environmental problem as a problem for its audience – for grabbing the audience's attention.

"Scientific findings and testimony by themselves are not always sufficient to push an environmental problem past the break point of legitimacy" (Hannigan 2014:63). Though science is essential to framing an environmental problem, the public are likely to forget about most news stories that do not capture their attentions, since "the audience seeks emotional stimulation" in order to find a story sensational (Seale 2003:517). In his research on media narratives of health risks, Clive Seale identified a pattern these stories follow to shock and stick with the audience, the main element being that the story exposes "the dangers of modern life" (2003:521). Essentially, a story that presents an unexpected, damaging outcome from a mundane situation presents a danger of living in modern, industrialized areas. This, he calls a "twitch" and "reversal" (520).

Reversals occur when the media presents a story that reverses the expectations of the audience, for example if a neo-Nazi donated a kidney to a minority member. A *twitch* is subtler than a reversal, though it will "disrupt expectations in an emotionally stimulating way," it does not fully oppose an expected outcome (520). An example of a twitch would be media coverage of a stray dog going into a burning house to save an adult. This is not impossible, but it is not completely predictable (Kitzinger 2000; Seale 2003). Both twitches and reversals are not part of the story, but they *are* the story, in that the entire coverage of the issue is a twitch or reversal, intended to capture audience attention. These formats are common in environmental issue stories, as they almost always cover dangers of living in a modern world.

In order to grab attention – and hold it – the media needs to be able to employ strategies, typically within twitches and reversals, akin to those used by marketing agencies. As found by Young & Rubicon, an advertising agency based in New York City, there are four elements that help predict an audience's response to a marketed product: *distinctiveness*, *relevance*, *stature*, and *familiarity* (Brodie 2014; Hannigan 2014; Scotland 1994).

Distinctiveness requires that a problem be unique from other problems. For instance, most audiences would be less concerned with discussions of water pollution in general, but an issue of specific, harmful water pollution, such as chemical toxins from industrial sites, catches the eye. An issue must be relevant to

be sensational. *Relevance* indicates the ability of the layperson audience member to connect to the issue (Brodie 2014; Hannigan 2014; Scotland 1994). To increase distinctiveness and relevance, the media must portray the issue "as novel and important" in order to construct an environmental problem successfully (Hannigan 2006:78). Without novelty or urgency, environmental issues are typically not taken seriously.

Stature, in terms of environmental problems, indicates the importance of the area or creatures at risk due to the problem, and *familiarity* denotes an audience's knowledge level regarding the problem. Ensuring familiarity is the task of the media, but there is a balance between ensuring an audience is familiar with a problem and tiring the issue. If a media source continuously covers the same story line with no new information, the audience will get bored and the environmental issue will be unsuccessfully framed (Brodie 2014; Hannigan 2014; Scotland 1994). Coverage time, therefore, is an important factor in successful framing of environmental problems. It is critical for an environmental problem to be given media coverage – and ample coverage time – in order for public awareness to occur and push for a solution. A problem with no media coverage faces little to no chance to become public knowledge or enter the political arena (Hannigan 2006:79). An environmental problem given only a short amount of coverage time faces a similar fate: the concern may arise instantly, but it is quick to fade (Szasz 1995).

A scope of location is typically involved in establishing distinctiveness, relevance, stature, and familiarity, and thereby successfully framing an environmental story. Solesbury purports that "global concepts of environmental quality, improvement and conservation" lend power to environmental issues (1976:380). In 1984, Lowe and Morrison regarded the "global approach...both figuratively and literally" taken in environmental news coverage (75). Although Corbett (1993) agrees "environmental reporting may have the added benefit of avoiding conflict surrounding sensitive local problems," in her analysis of ozone hole news coverage she found "creating relevance (and hence newsworthiness) for local audiences may have as much value as pointing to someone else's ozone hole up-the-road" (81-87). While environmental issues generally do reflect a global problem, audiences are much more likely to identify with a problem when it is in their own backyards. Similarly, the severity of the problem needs to be stated (Hannigan 2014). For instance, does this problem mean that residents exposed to a chemical leak will develop cancer immediately or does it cause diseases that develop over a period of years? The more drastic the severity, the more attention the public will show (Kitzinger 2000; Seale 2003).

Once the public is caught up in the coverage of the environmental problem and well aware of the scientific evidence surrounding it, supporters want to know what can be done to help, dissenters contest the issue, and those on the fence need persuading. Solutions to environmental problems must be discussed in terms of

economic and practical benefits in order to sway the unsure or contestant. Economic benefits are those elements of a solution that would bolster or protect an economy, and failure to do so might harm the economy. These include the threat of industrial closings, loss of natural resources that are essential to industry, and even "that the tropical rainforests contained an untapped wealth of pharmaceuticals that would disappear forever if nothing were to be done" to stop deforestation (Hannigan 2014:70). Practical benefits are those bite-sized tasks that the average person can do, such as helping pick up litter or rally to protect and injured animal. These benefits must be presented in the media as "tangible results in the here and now," since achievable aims captivate audiences and inspire action more than large-scale, complex projects (Hannigan 2014:113).

Frames of river pollution

In existing literature regarding environmental problems, three frames towards environmental problems employed by the media emerge: these problems threaten health, community, or economic stability. These frames are predicted to be intertwined throughout the media narrative of pollution. Each of the three applies the criteria necessary for successfully framing an environmental problem: scientific backing, distinctiveness, relevance, stature, familiarity, locational scope, severity, and benefits of solving the problem. Therefore, the implementation of these frames by the media indicates an attempt to frame the pollution as an environmental problem.

The two frames of river pollution predicted to be paramount in media discourse are pollution as *harming human health*, targeted towards those who view the river as a source of drinking water, and pollution as *attacking Southern culture*, for those who interpret the river as a recreational or historic location. The third frame originates in viewing the Tennessee River as an industrial resource, where pollution is *threatening the local economy*.

Harming human health: health concerns due to pollution

The pollution of the Tennessee River in the southeastern United States has been in progress for decades, since many industries have staked claims along its banks – even before the Tennessee Valley Authority's advent in 1933 – including the production of explosive material during World War I (Barnes-Svarney 1995; Olsson 2017). These waterways are the source for thousands of people's daily drinking water, and polluting chemicals, such as the PFCs (perfluorinated chemicals) perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), are directly correlated with a number of health concerns including thyroid disruptions and cancer, hormonal imbalances, and immune disorders (Coperchini et al. 2017; Hu et al. 2016; Kjeldsen and Bonefeld-Jørgensen 2013).

PFOA and PFOS are found in many common goods, including sportswear and gear, nonstick cookware, and culinary equipment (Knepper and Lange 2013). The presence of PFCs from sources other than drinking water increases the importance of having PFC-free water, as these chemicals are bioaccumulative,

meaning they compound in the body, and cause more harm with greater exposure (Coperchini et al. 2017; Cui et al. 2008; Newton et al. 2017; Office of Water 2016a; Office of Water 2016b). In 2000, 3M conducted research on PFOS emissions that ended with a Drinking Water Health Advisory, or DWHA. This DWHA, based on drinking a normal dosage (two liters) of contaminated water daily, reported that drinking water accounts for only twenty percent of a person's daily exposure to PFOS (Hansen et al. 2002).

PFOS and PFOA are proposed to be more potent when wet, furthering their threat when in drinking water. Bach et al. called for more research to be done on this relationship, citing their "synergistic" potential with water, as these PFCs are commonly found in herbicides and pesticides, which require water to increase penetration capacity (2017:4924).

Even found at low concentrations in drinking water, these PFCs – also known as perfluoroalkyl and polyfluoroalkyl substances (PFASs) – are dangerous, as Hu et al. found: "exposure from drinking water is a serious concern because of the high aqueous solubility of many PFASs" (2016:345). However, in areas surrounding the river, PFASs are found in high concentrations. During the EPA's 2013-2015 UCMR3 (the third Unregulated Contaminant Monitoring Rule), PFOS was found in the region's drinking water at a level of 71-200 nanograms per liter, while PFOA was found at a level of 71-100 nanograms per liter (Hu et al. 2016).

In May 2016, the EPA issued lifetime health advisories stating that

exposure for PFOS and PFOA below 70 parts per trillion, equating to 70 nanograms per liter, should not cause adverse health effects (Environmental Protection Agency 2016). While the claims indicate that deleterious effects are unlikely to occur below this level, the region's water supply is concentrated higher than the limit (Hu et al. 2016).

These health risks are predicted to be a primary concern of residents, and therefore a primary media angle, as an increase in health concerns incites action and viewership. When news regarding environmental health hazards occurs, the media is generally quick to pick up on the story (Hannigan 2014). Indeed, "environmental dangers…are also much emphasized in health-related scare stories" (Seale 2003:521). While this information is breaking news of which the public needed to be aware, "people do not make TV programmes or publish newspapers solely in order to provide the public with accurate health information" (Seale 2003:519). This media coverage is meant both to inform and to draw an audience, as the idea that drinking water might kill or impair its drinkers brings a shock, especially when those in danger are the primary audience (Seale 2003). As Séguin, Pelletier, and Hunsley uncovered: "perceptions of the quality of the environmental conditions and the severity of environmental health risks...can provide incentives to individuals and lead them to become more active toward their environment" (1998:631). Baldassare and Katz (1992) found that individuals who view air and water pollution as a threat to their health are the most likely to

take action against it. This type of news generally increases the media's audience as more people become concerned and seek out developments in the story.

Attacking Southern culture: recreational and historical damage from pollution

Besides health risks increasing the likelihood of environmental engagement in the South, many Southerners staunchly defend their lands, due to cultural significance and the independent attitude typical of the region. Defining the South as a geographical region can be difficult, as some definitions list those states that seceded from the United States and became the Confederate States of America (CSA), while others leave Texas out of the same list but may add Oklahoma (Griessman 1977). For the purpose of this research, the South is defined as those states south of the Mason-Dixon line which also became the CSA.

In order to understand the South's present-day perceptions of the environment and environmental problems, one must examine the historical viewpoint of the South, mainly those principles of fighting for one's beliefs and protecting one's land and community, which some still revere as the Confederate mentality from the Civil War. Southerners still live in close geographic and familial proximity to Civil War reminders, from relatives whose legacies have yet to die to battlegrounds and Confederate monuments, and many southern families preach "that it is a glorious thing to respond to the call of the bugle and the roll of the drums" (Griessman 1977:xx).

The promotion of the ideology that Southerners should defend one's country and beliefs are evidenced today in the United States' military. In fact, in a 2016 article entitled "How the U.S. Military Became a 'Southern Family Business,'" Braswell cites a statistic that the U.S. military is made up of nearly forty-four percent Southerners, even though the South comprises less than forty percent of the nation's population. Braswell attributes this phenomenon to Southern history – not only the Civil War era, but going back further to the Celtic settlers, who have fought for two millennia and, as he quotes Jim Webb, whose "military virtues have been passed down at the dinner table" (2016). The military talents of this region are showcased in Alabama's legacy as a powerhouse for fighting. During World War I, Alabama's 167th Infantry, called "The Immortals" for their bravery and heroism, displayed these Southern military standards (Frazer 2014:4). Famously, Brigadier General Plummer commanded "In time of war, send me all the Alabamians you can get!" (Frazer 2014:v).

While there are multiple factors that explain why Southerners are more represented in the military, such as otherwise limited college tuition options, it is evident that the prime factor is the region's heritage of fighting for what one believes is right (Braswell 2016). Indeed, the state motto of Alabama – "We dare defend our rights" – is incredibly appropriate (Alabama Department of Archives and History 2014). Invariably, fighting for one's rights involves fighting for one's community (Stoecker 2010).

Before one can understand why Southerners would defend their community, the concept of community must be examined. Generally speaking, *community* is a familiar idea that typically references groups of people who identify as similar to one another in some way, be it geographically, historically, ideologically, ethnically, religiously, economically, or so on. While Southern communities certainly consist of similarities between individuals – in some cases going so far as to squelch differences – the South boasts communities that esteem and encourage individuality within the group, and Southern community features at its core "personal touch...the ability of people to relate to one another in human terms" (Lewis 1977:18). In the southern portion of the United States, the sense of community between residents has been strengthened by this personal touch, especially due to the strong family ties and the slow rate of industrialization of the area (Lewis 1977; Reed 1993).

Most Southerners are endowed "with a deeply-rooted cultural sense of place, belonging, and community," which typically begins with family (Walton and Bailey 2008:120). A 1987 study by John Shelton Reed detailed that Southerners self-identify with the descriptions of "conservative," "tradition-loving," "loyal to family ties," "stubborn," "extremely nationalistic," and "faithful," among other adjectives, but loyalty to family was determined to be the most common "Southern" trait in his research (1993:69-73). Therefore, one's community almost always includes one's family, and a threat to community is

likely perceived as a threat to family.

In his research interviewing Alabamans on changes in the South, W. David Lewis found that the second-most common theme in the interviews was not against technology and growth, but instead respondents tended toward the notion that the South could not "afford to be hostile to growth" (1977:18). However, the distrust of industry as opposed to local business and fear of losing a feeling of community were linked. This threat to community was mentioned by each respondent, and it was noted that the sense of community in the South was already weaker than it had been and was likely to weaken over time, especially if larger corporations moved into the area (1977). Defending natural resources from the "others" in corporations and governmental institutions brings a sense of community for Southerners, allowing for a marked division between "them" (the institutions) and "us" (the community).

In protecting one's community, recreational activities must also be protected, as hobbies and recreation are often largely important to community and culture. This is especially true if there is an economic link to recreation, as this can affect one's livelihood or family's financial stability (Bryan 2000). In his book *River Republic: The Fall and Rise of America's Rivers*, Daniel McCool penned:

> Americans want rivers that are clean, free-flowing, teeming with fish and wildlife, and inviting for sports and recreation. People want living rivers, not dead rivers...When rivers die, we die, both literally and figuratively.

> We save rivers because rivers save us - from our foibles, our loneliness, our frantic pace, our boredom (2014:8, 303).

These statements ring true along the Tennessee River. Residents desire clean, wildlife-filled waters that are safe to drink and fish. Indeed, "the state of Alabama…has tremendous recreational fishing resources" (Ojumu, Hite, and Fields 2009:2), and in their research on recreational fishing bait sales in Alabama, Wallace, Hanson, and Hatch proved recreational fishing to be a major industry in the state, bringing in millions of dollars across the state each year (2004). Unfortunately for the Tennessee River, point sources of pollution are cited as a large threat to its freshwater life, whose endangerment is ranked as one of the highest in North America (Jelks et al. 2008; Thieme et al. 2016).

As Walton and Bailey discovered, Southerners tend to be advocates of environmental protection when the movement is framed the right way, but environmental promotion in the media must project the cultural relevance and freedom that river restoration and conservation can achieve. Rivers and their surrounding lands are Southerners' history, where their ancestors lived and died, their recreational area for hunting and fishing – which for some, constitute a means of sustenance, and their source of independence from government and big business. Therefore, natural resources must be safe from harm in order for their cultural heritage and pursuit of recreation to continue (2008). If local environmental resources and people are perceived to be threatened, environmental

action is likely to be promoted in the media and undertaken by locals, especially in a region as community- and family-oriented as the South (Macias and Williams 2016; McGee 1999; Séguin et al. 1998; Walton and Bailey 2008).

Threatening the economy: industrial and economic damage from pollution

If money makes the world go 'round, it also is able to incite environmental concern. While not being as prevalent, since individuals with industrial concern are generally not as heavily concerned for the environment, the idea that the Tennessee River as an industrial resource is at stake is certainly a cause for environmental action (Bridgeland and Sofranko 1978). As aforementioned, the Tennessee Valley has a long history as an industrial powerhouse, especially after World War I, and since multiple generations were raised knowing the river as a place of commercial enterprise, many residents grew up to work at the industries lining its banks (Olsson 2017). In fact, industry is one of the factors that increases the likelihood of an individual bonding with a location, especially when their family has lived in the area for years, making the threat of losing industry frightening economically and culturally (Vorkinn and Riese 2001). Losing historically local facilities is a problem because history – as previously discussed – is important to Southerners, and ensuring a booming economy is important to all residents.

The fear of losing industry along the Tennessee River as a motivation for environmental concern is counterintuitive at first glance, as fighting pollution

almost always causes financial harm to companies. However, there is reconciliation between the two: in the long run, polluting harms an industry more than preventing pollution, since polluting is more likely to cause industry closures. There is economic incentive for industries to prevent pollution, due to the following:

(1) Investors do not like sponsoring companies with bad images.

(2) Polluting causes a bad image, and the media likes to spread this news.

(3) Companies that are caught polluting are more likely to fail.

First and foremost, these three are linked in a cycle, and the best way to avoid plant closure is to prevent pollution, even if that takes a temporary financial toll on the company, as these measures not only prevent pollution and a marred image but also tend to increase productivity (Kassinis and Vafeas 2009).

Capelle-Blancard and Laguna (2010) examined the effects that chemical disasters had on the stock market. They found that in the two days following a disaster, the stock market's negative reaction averaged losses of roughly 1.3 percent, with the severity of the accident proportional to the significance of the loss. Further, just one injury or death resulted in losses of nearly $164 million (USD), and toxic releases occurring added another one billion dollars to the losses. Losses are steeper if companies have bad track records in terms of safety or environmental practices. They also found that the lower a company's accident occurrence, the more likely investors are willing to continue investing in a

company. While the economic cost of accidents is high, they "are proportional to the social cost of the accident" (205).

This social cost is paid by the negative publicity that comes with media coverage of accidents and of regular emissions. Though accidents are the most sensational environmental topic to cover and often the "turning point for an environmental problem" to gain popularization, regular toxic emissions can be considered newsworthy (Hannigan 2014:63). In two studies on the Toxic Release Inventory (TRI), the effect of emissions reporting proved to be damaging to manufacturing companies in terms of media coverage and investor support.

The TRI is a mandated self-reporting program that requires companies in the U.S. that manufacture over 500 pounds of any of 320 certain chemicals and have ten or more employees to report the emissions of these toxic chemicals annually, and the EPA upkeeps these totals (Hamilton 1995; Saha and Mohr 2013). In fact, the TRI has become "a popular alternative to traditional environmental regulations," due to its "unconventional nature" and "success attributed to it in reducing toxic releases" since its creation in 1989 (Saha and Mohr 2013:290).

Saha and Mohr (2013) analyzed TRI data, and found that the negative publicity stirred from TRI data in print media "imposes a cost on firms and provides incentives to reduce the production of or prevent the release of toxic chemicals" (284). Again, this cost involves the social aspect of negative publicity,

which leads to an economic cost. This study uncovered that "facilities that are highlighted in the press diminish their releases more than those that are not," and those that were not in the press were mostly lower in toxic releases. The heaviest polluters "announced initiatives, specifically in response to the negative publicity associated with the TRI, to drastically reduce production of toxic substances" (291). Yet this does not necessarily bode well for companies, as uncovered by Kassinis and Vafeas, pollution reduction strategies are often times costly enough to force plants to close, as "manufacturing facilities were more likely to close down when they reduced their toxic emissions" (2009:493).

By studying the June 1989 TRI, Hamilton discovered that this system serves as a mechanism for pollution control, as "the TRI data have become the metric to measure a company's waste generation and pollution reduction activities" (1995:98). This measurement is done through writings by groups such as environmental activists identifying pollution issues, law enforcement focusing on environmental law breaches, the stockholders of the industry, and the media. The interplay between the stockholders and the media is critical, as the media makes public the status of companies in which stockholders invest. The media focused on TRI release data that was unexpected or larger than expected. Industries already associated with pollution were less newsworthy than those not already involved in such, and companies known to pollute were not reported as heavily as novel polluters, yet if there were high levels of pollution in any

industry, this was reported. The stockholders responded immediately to the news. The day the TRI results were made public, average return was negative for companies who participated in the June 1989 TRI, losing an average stock value of over $4 million (USD) in the first day. This loss, akin to that of companies in which a chemical disaster occurred, was proportional to the number of chemicals reported by a company: the longer the list, the heavier the loss. This was not the same for those companies who had already established themselves as likely to pollute (Hamilton 1995).

Although pollution is not always reported by the company, when it is discovered, there will be economic losses and negative publicity for that company. As a result of the media coverage of the pollution, if stockholders pull their support and the company begins a process of pollution reduction, the economic cost can be high enough to cause plant closures. Since locals in industrial areas generally care about those industries, which bolster the local economy, they are likely to become environmentally involved upon news of pollution.

Present Study

The existing literature illuminates five major frames that are likely to occur in newspaper media in Alabama regarding river pollution: *Health*, *Economy*, *Culture*, *Recreation*, and *Activism*. *Health* would occur when pollution as it would harm or pose a threat to human health is discussed. *Economy* refers to

any mention of industry or money, especially in terms of being affected by pollution. *Culture* includes any nod to history, family, culture, or Southern heritage, as it related to the Tennessee River or being threatened by the river's pollution. *Recreation* was separated from Southern culture for the purpose of this analysis, since it involves discussion of fishing, boating, the general use the river as a source of recreation, or effects towards wildlife, specifically in terms of being affected by pollution. *Activism* shows up when individuals or groups involved in practically beneficial, anti-river-pollution, or environmentally concerned activities were mentioned.

While there is much research proving river pollution negatively affects humans and the environment, there is a lacuna in sociological knowledge regarding media portrayals of river pollution in the Southeastern United States. Especially regarding the Tennessee River, there is not an existing study available that determines to what extent media framing of environmental issues is successful. This research seeks to fill that gap in knowledge through a content analysis of local newspaper articles involving Tennessee River pollution.

CHAPTER 3: METHODOLOGY

Qualitative Research: Content Analysis

This research utilizes a content analysis of newspaper articles in order to assess media framing of the Tennessee River pollution. A content analysis is a method of social research that can be used to analyze artifacts such as books, print news media, televised media, and advertisements through semantic and syntactical exploration of terms, concepts, or themes appearing in said artifacts (Schwartz and Jacobs 1979). For this research, the artifacts chosen for analysis were newspaper articles, and the method for analysis was counting key themes appearing therein.

Sample and data collection

The criteria for selection as an artifact in this research were the following: the document must be a newspaper article published in the state of Alabama between January 2010 and March 2018. Newspaper articles were the selected medium of analysis due to their local reach, local focus, and relative ease of access. Alabama was chosen as the geographic range due to the recent pollution lawsuits regarding the 3M contamination in an Alabama locale of the Tennessee River. The year 2010 was selected as a starting date due to it being the year the state of Alabama was listed as third in the nation by Environment America for carcinogenic waterway pollution and the Tennessee River as fifth for carcinogenic toxins, seventh for potential reproductive toxins, eleventh for developmental

toxins, and fourteenth for overall toxins (Gray 2012). March 2018 was the end date, due to it being the last full month before research began.

Data was collected via LexisNexis and Access World News, using the phrases "Tennessee River," "pollution," "polluters," "3M," "TVA," and the specific years in question. This process rendered 41 newspaper articles, including news, editorials, and letters to the editor.

Data analysis

The articles were analyzed for instances of frames used. These five frames, as previously mentioned, were established from existing literature: *Health*, *Economy*, *Culture*, *Recreation*, and *Activism*.

Health was identified by mention of pollution as it would negatively affect human health.

Economy referred to any mention of industry or money.

Culture included any nod to history, family, culture, or Southern heritage.

Recreation involved using the river as a source of recreation.

Activism was spotted when anti-river-pollution activities were mentioned.

The occurrence of each frame was tallied then totaled, organized by frame occurrence and date (month and year). It should be noted that many articles contained more than one frame, so there is not a one-to-one relationship between frames and articles. These totals were used to identify framework usage, temporal patterns, and ultimately, whether or not the media constructed an environmental

problem in media coverage of the river pollution.

The temporal patterns were established based upon the months and years the articles were published in order to observe if, like research suggested, media (and potentially investors) respond quickly to news that negatively portrays an industry in terms of environmental management. The longer the period of time between the event or subject of the article happening and the article's publication, the weaker the effect would be on framing the issue (Capelle-Blancard and Laguna 2010; Hannigan 2014).

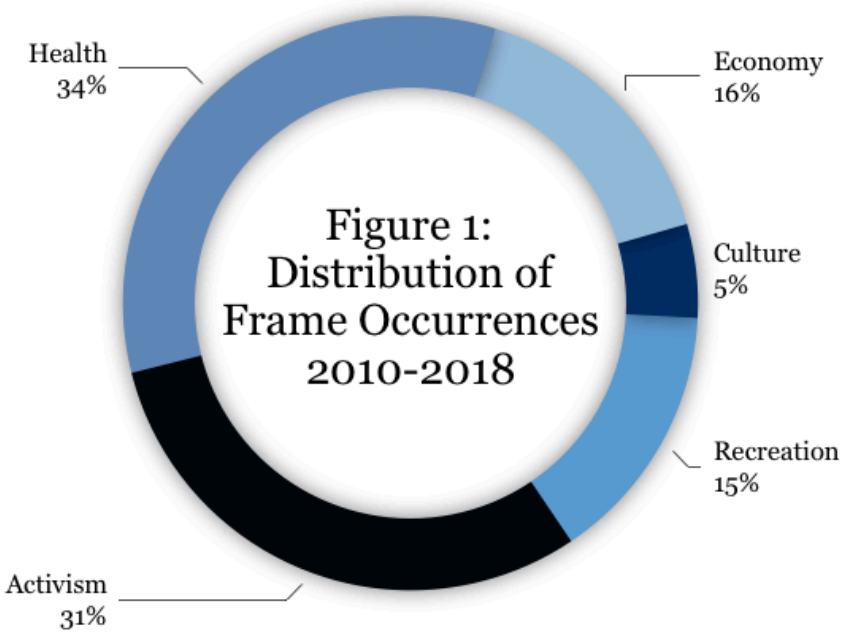
CHAPTER 4: FINDINGS AND DISCUSSION

Findings

This chapter will review the findings of the content analysis, followed by a discussion of these findings.

Frameworks used

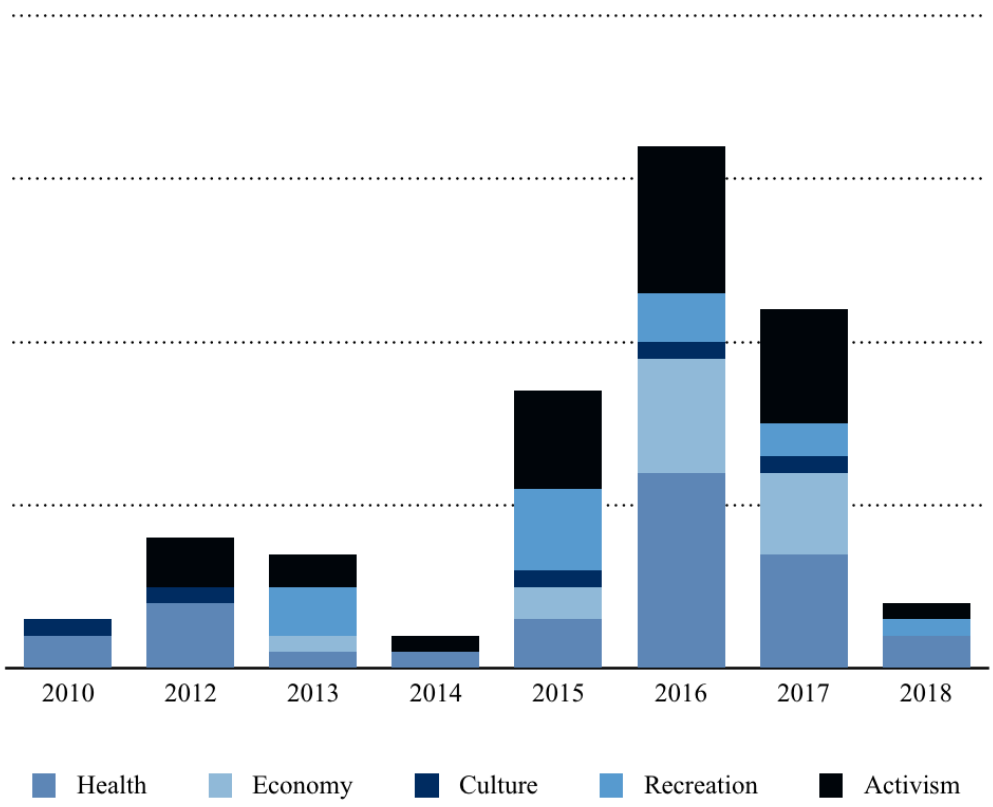
Existing literature pointed to five main frames that would likely be utilized by the media, and indeed each of these was found during the analysis. The analysis of the usage of these frameworks was done in a categorical and temporal manner. The tabulation of occurrence of each frame by year and by month/year can be found in Tables 1 and 2 in Appendices A and B, respectively.



Frame occurrences: overall

The human health frame, identified by mention of pollution and its effects having deleterious health consequences, was most prominent in terms of usage. As shown in Figure 1 and Table 1, *Health* dominated the other frames with 34 percent of the articles using it, or 32 of the 41 articles featuring it. *Health* was followed closely by *Activism*, at 31 percent, or 29 of the 41 articles. After *Activism* came *Economy* at 16 percent (15 of 41 articles), and 15 percent of the articles featured *Recreation* (14 out of 41 articles). The least used frame was *Culture*, which was only featured in 5 of the 41 articles and pulled up the rear at 5 percent (Figure 1; Table 1).

Figure 2: Distribution of Frame Occurrences
2010-2018



Frame occurrences: by year

As seen in Figure 2, the distribution of frame occurrences was not constant each year. The most used frame, *Health*, was found at least once each year, and *Activism*, the second-most used frame, was found in each year but 2010. The breakdown of frames used per year, based on Table 1 and Figure 2, is as follows:

Health was used in all eight years.

Activism was used each of the years except 2010.

Culture was found in 5 of the years: 2010, 2012, 2015, 2016, and 2017.

Recreation was in 5 out of eight years: 2013, 2015, 2016, 2017, and 2018.

Economy was used 4 years: 2013, 2015, 2016, and 2017.

The year with the most frames used was 2016, which also boasted the most newspaper articles published on the subject. This is certainly due to the EPA's release of the health advisories in May 2016 (Environmental Protection Agency 2016). 2015 and 2017 held all five frames as well, but the occurrences of each were less than in 2016. 2014 was the year with the smallest number of frames used, with 2 frames found in only 1 article, likely due to the lack of developments in pollution coverage (Figure 2; Table 1). The following is an itemization of the frame occurrences each year, with the number of articles that year in parentheses:

2010: (2) – 2 *Health*; 1 *Culture*

2011: (0)

2012: (4) – 4 *Health*; 1 *Culture*; 3 *Activism*

2013: (3) – 1 *Health*; 1 *Economy*; 3 *Recreation*; 2 *Activism*

2014: (1) – 1 *Health*; 1 *Activism*

2015: (8) – 3 *Health*; 2 *Economy*; 1 *Culture*, 5 *Recreation*; 6 *Activism*

2016: (13) – 12 *Health*; 7 *Economy*; 1 *Culture*; 3 *Recreation*; 9 *Activism*

2017: (8) – 7 *Health*; 5 *Economy*; 1 *Culture*; 2 *Recreation*; 7 *Activism*

2018 (incomplete year): (2) – 2 *Health*; 1 *Recreation*; 1 *Activism*

2016 featured the only article with all five frames. This article, entitled "Group sues 3M over Tennessee River substances," was published on June 25 by The News Courier of Athens, Alabama. The main point of the article is to bring attention to the lawsuit being filed by one of the main subjects of the *Activism* frame, the Tennessee Riverkeeper, against 3M. The article ties together the effects on health and wildlife, while defending the need for industry in the area and calling the Tennessee Riverkeeper members "the river's users and guardians," invoking the *Health*, *Recreation*, *Economy*, and *Culture* frames (Local News).

Frame occurrences: by month and year

Table 2 in Appendix B and Figures 3 through 10 in Appendix C display the frame distributions by month and year. The month with the most frames used was June 2016, where 6 articles featured 5 *Health*, 2 *Economy*, 1 *Culture*, 2 *Recreation*, and 3 *Activism* frame occurrences (Figure 8; Table 2). The only other month featuring an occurrence of all five frames is November 2015. This month

held two instances of each frame, except for Culture, which was found once (Table 2). An itemization of frame usage by month and year is as follows, with number of articles in parentheses (Figures 3-10; Table 2):

2010: (2)

October (2) – 2 *Health*; 1 *Culture*

2011: (0)

2012: (4)

March (1) – 1 *Health*

April (2) – 2 *Health*; 1 *Culture*; 2 *Activism*

August (1) – 1 *Health*; 1 *Activism*

2013: (3)

April (2) – 1 *Health*; 1 *Economy*; 2 *Recreation*; 2 *Activism*

October (1) – 1 *Recreation*

2014: (1)

February (1) – 1 *Health*; 1 *Activism*

2015: (8)

April (1) – 1 *Recreation*; 1 *Activism*

May (2) – 2 *Recreation*; 1 *Activism*

September (1) – 1 *Activism*

October (1) – 1 *Health*; 1 *Activism*

November (3) – 2 *Health*; 2 *Economy*; 1 *Culture*; 2 *Recreation*; 2

Activism

2016: (13)

January (1) – 1 *Health*; 1 *Recreation*; 1 *Activism*

June (6) – 5 *Health*; 2 *Economy*; 1 *Culture*; 2 *Recreation*; 3 *Activism*

July (3) – 3 *Health*; 3 *Economy*; 2 *Activism*

September (2) – 2 *Health*; 2 *Economy*; 2 *Activism*

November (1) – 1 *Health*; 1 *Activism*

2017: (8)

January (1) – 1 *Health*; 1 *Economy*; 1 *Activism*

February (1) – 1 *Health*; 1 *Economy*; 1 *Activism*

July (2) – 2 *Health*; 1 *Economy*; 2 *Activism*

August (1) – 1 *Health*; 1 *Economy*; 1 *Culture*; 1 *Recreation*

November (2) – 1 *Health*; 1 *Economy*; 1 *Recreation*; 2 *Activism*

December (1) – 1 *Health*; 1 *Activism*

2018: (2)

February (1) – 1 *Health*; 1 *Recreation*; 1 *Activism*

March (1) – 1 *Health*

The publication pattern (Appendix D) throughout the years by month is notable. 2010 and 2014 showed publications in only one month of the year: October 2010 and February 2014. Two months in 2013 – April and October – and

2018, which is still in progress – February and March – had articles published. Three months out of 2012 had publications: March, April, and August. 2015 and 2016 held five months of publications. For 2015, these were April, May, September, October, and November; and for 2016, January, June, July, September, and November. 2017, while not the most prolific year, had the greatest number of months with publications at six: January, February, July, August, November, and December (Figure 11).

Discussion

The findings point to the conclusion that the media did indeed frame the river pollution as an environmental problem, due to the media's heavy usage of frames that would appeal to the locals of the Tennessee Valley as a means of invoking environmental action.

Frames most and least utilized

Regarding framing usage, it was somewhat surprising that *Health* and *Activism* were the most used frameworks. While it was predicted that health would be a primary concern in the media, it was not predicted that media attention towards practical benefits would be so strong. However, the patterns of usage for each of the frames are different. *Health*, appearing in 2010, is a critical issue of concern from the start. This frame is attention-grabbing and attention-keeping, and it causes concern for the environment, community, and personal health. In this way, it is a springboard for concern towards the other frames. In one letter to

the editor from 2012, a local wrote about the recent ranking of the Tennessee River as the fifth-most polluted river in the country, followed immediately with "this river is a part of us; it is our home and place of camaraderie. It is our right to have a safe, public water supply," completing the letter by discussing the work of activists in ensuring a safe water supply (Stoner). This illuminates the progress from health concerns to cultural concerns (the river as a part of the locals' lives and a location of companionship) to taking action.

The omission of *Activism* from 2010 shows that the media was documenting the problem, then offering up examples of individuals working on solutions to the problem, after the problem had already been established. From 2012 onward, *Activism* was found in at least one article, sometimes being the only other frame found alongside *Health*. This means that the media found the practical benefits to be newsworthy, and framed the problem as having solutions in which local people could participate. In fact, there were 6 articles focused on tasks individuals are doing or can do to help promote a cleaner river. "Most importantly, we must recognize the role each of us has played in creating these crises and the crucial role we play in solving the problems," claims one article, following this call to action with a list of practical benefits most individuals could undertake (Lowry 2016).

The frame that was found the least, *Culture*, was always found alongside *Health*, and 3 of its 5 appearances were in conjunction with both *Economy* and

Recreation. This is not surprising, due to the fact that *Recreation* and *Culture* are theoretically linked, as are *Economy* and *Culture*. It is noteworthy that *Recreation* was found more than *Culture*, which is likely due to *Recreation* being directly, immediately, and tangibly affected by river pollution, whereas *Culture* takes a bit longer to affect and the effects are often intangible and tenuous to prove. This could also explain why *Culture* was the only frame never found occurring more than once a year, whereas every other frame was identified in multiple documents in nearly every year.

Similarly, appeals to preserving *Culture* were manifested through use of the *Economy* frame. In the case of November 2015, media coverage focused heavily on the threat of federal programs replacing state ones due to budget cuts to state environmental management. The cry of the media was to rally behind the state government, even if they are not perfectly completing their tasks, to avoid losing industry should the EPA take control. The preference of a stronger state government over federal strength was inferred, as was the locals' inclination to keep industry in the area, filing the *Culture* frame within the easier-to-understand *Economy* frame as a means of connecting to a larger audience (Hannigan 2014; Harris 2015; Staff Writer 2015).

Temporal patterns of frame usage

The findings of the content analysis support the prediction that the media will cover an environmental problem rapidly following critical events (Capelle-

Blancard and Laguna 2010; Hannigan 2014) As previously established, June 2016 held the record for most frame occurrences, due to the EPA's health advisory release in May 2016 (Environmental Protection Agency 2016). The media increased coverage of the river pollution the month following the health advisories, June 2016, including more stories about the hazards of river pollution and the means by which people are taking action against it.

Similarly, in November 2015, the only month besides June 2016 to include every frame, the media covered the newly-imposed limitations to the budget of ADEM (Alabama Department of Environmental Management) as of September 2015. The two articles covering the topic of ADEM's budget cuts did not begin by discussing money. Instead, "ADEM in jeopardy of losing authority; local fishermen worry about fish health" opened with testimonials about the health risks posed to fish and humans who consume said fish, due to the pollution of the Tennessee River. The budget cuts, the article covers, would detract from prospects of new industry, because the federal EPA would be forced to take over state-run ADEM's place if ADEM could not sufficiently control pollution (Harris 2015). "State should fund environmental protection," published the following day in the same newspaper, began with the *Culture* frame: "The Tennessee River is the lifeblood of the Tennessee Valley," it acclaimed early in the article and closed with the threat of the federal government stepping in where Alabama state government should be (Staff Writer 2015:Editorials). This month's articles

expertly linked the relationship between the five frames, all of which are clearly important to locals because the media is selling their stories by the heavy use of these frames. Southern *Culture* favors state governments over federal government, and the prospect of the EPA overtaking ADEM is a motivation to ensure ADEM remains funded. If ADEM were to lose more funding and not be able to manage pollution and the EPA took over, the industry in the area would suffer, since the EPA is more stringent than ADEM. Here is the link to the *Economy* frame. Similarly, the idea that the fish in the river are unsafe to eat brings together the *Health*, *Recreation*, and *Economy* frames.

Since 2015, 2016, and 2017 included the most number of articles and the months with the most articles published, the media certainly covered the pollution during the crux of legal and moral dispute. After the EPA health advisory, not only did June 2016 come with 6 articles, July 2016 had 3 articles, which ties with November 2015 – following budget cuts to ADEM in September 2015 – for the second-most prolific month (Figure 11; Table 2). This provides evidence to back the notion that the media was timely and consistent in covering the environmental problem, thereby framing the pollution as a problem through publication response time and coverage time (Hannigan 2014).

Conclusion

While the Tennessee Valley, located in the Heart of Dixie, has not always featured the most environmentally-friendly attitudes, a content analysis of the

area's newspaper articles proved that the media in this area will frame pollution as an environmental problem and attempt to rally locals to engage in practices to mitigate the effects and stop the persistence of river pollution. The analysis of the media's framing of river pollution rendered findings that illuminate media patterns in the area in terms of frames used and the readiness of reporting on pollution-centered issues, which indicate the local media successfully framed the Tennessee River pollution as an environmental problem.

The primary discovery was that the media utilized two frames in nearly every article – pollution as a threat to human health and the ways that people are fighting pollution – while opting to combine another frame, *Culture*, with two others, *Recreation* and *Economy*. The *Health* frame was implemented from the first article onward, while the *Activism* frame began a short time later. This indicated that the media was interested in grabbing audience attention with health-related scare tactics, then offering solutions to the problems as these solutions and new information regarding the pollution emerged. In this way, *Health* was found to be a springboard into concern for the other frames.

The *Culture* frame – regarding pollution as a danger to Southern history, family ties, or heritage – was found to be disguised within the *Recreation* frame (pollution negatively affects recreation in the river and wildlife habitations) and the *Economy* frame (pollution poses a risk to industry along the river). This is most likely due to recreational activities and industry being tangible, easily-

grasped concepts that affect even those whose families have not lived in the area for generations, while Southern culture is more of a protocol for behavior. In these articles, there were extremely few mentions of the Tennessee River as it relates directly to culture or heritage, but there were cultural constructs involved in the media coverage of pollution as it brought recreational and wildlife harm, federal government menacing over state operations, and the potential for industries to leave or no longer develop.

Another important finding involved the media's enthusiasm to report on pollution-related stories. This was most notable after the EPA's Drinking Water Health Advisory in May 2016, as the media peaked in number of news articles and frames used the following month. Speed of reporting is a critical gauge to determine the extent to which the media wants to frame an environmental problem as a problem, and the media in Alabama responded in a manner that indicates their intent to frame the river pollution as such (Hannigan 2014).

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APPENDICES

Appendix A: Instances of Frame Occurrences, by Year

Table 1: Instances of Frame Occurrences

Year	Number of Articles	Health	Economy	Culture	Recreation	Activism
2010	2	2	0	1	0	0
2012	4	4	0	1	0	3
2013	3	1	1	0	3	2
2014	1	1	0	0	0	1
2015	8	3	2	1	5	6
2016	13	12	7	1	3	9
2017	8	7	5	1	2	7
2018	2	2	0	0	1	1
	41	32	15	5	14	29

Appendix B: Instances of Frame Occurrences, by Month and Year

Table 2: Instances of Frame Occurrence, by Month and Year

Year	Month	Number of Articles	Health	Economy	Culture	Recreation	Activism
2010	10/10	2	2	0	1	0	0
2012	03/12	1	1	0	0	0	0
	04/12	2	2	0	1	0	2
	08/12	1	1	0	0	0	1
2013	04/13	2	1	1	0	2	2
	10/13	1	0	0	0	1	0
2014	02/14	1	1	0	0	0	1
2015	04/15	1	0	0	0	1	1
	05/15	2	0	0	0	2	1
	09/15	1	0	0	0	0	1
	10/15	1	1	0	0	0	1
	11/15	3	2	2	1	2	2
2016	01/16	1	1	0	0	1	1
	06/16	6	5	2	1	2	3
	07/16	3	3	3	0	0	2
	09/16	2	2	2	0	0	2
	11/16	1	1	0	0	0	1
2017	01/17	1	1	1	0	0	1
	02/17	1	1	1	0	0	1
	07/17	2	2	1	0	0	2
	08/17	1	1	1	1	1	0
	11/17	2	1	1	0	1	2
	12/17	1	1	0	0	0	1
2018	02/18	1	1	0	0	1	1
	03/18	1	1	0	0	0	0
Totals		41	32	15	5	14	29

Appendix C: Breakdown of Frames Used by Month and Year

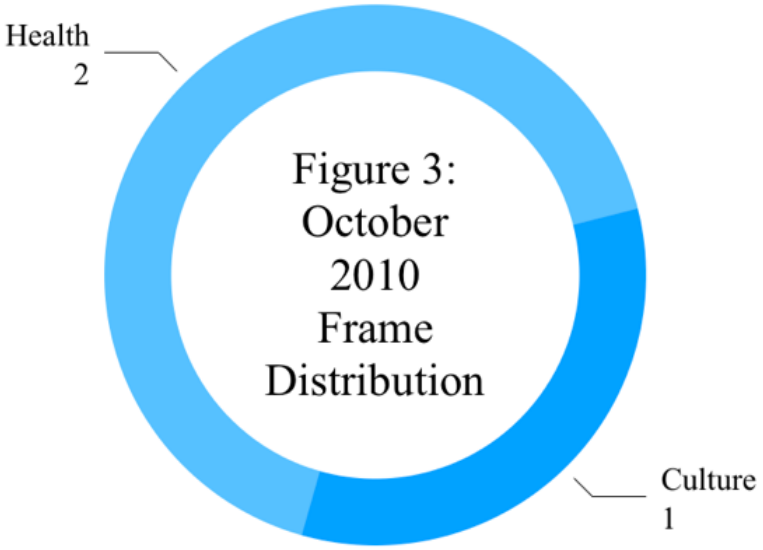


Figure 4: 2012 Frame Distribution by Month

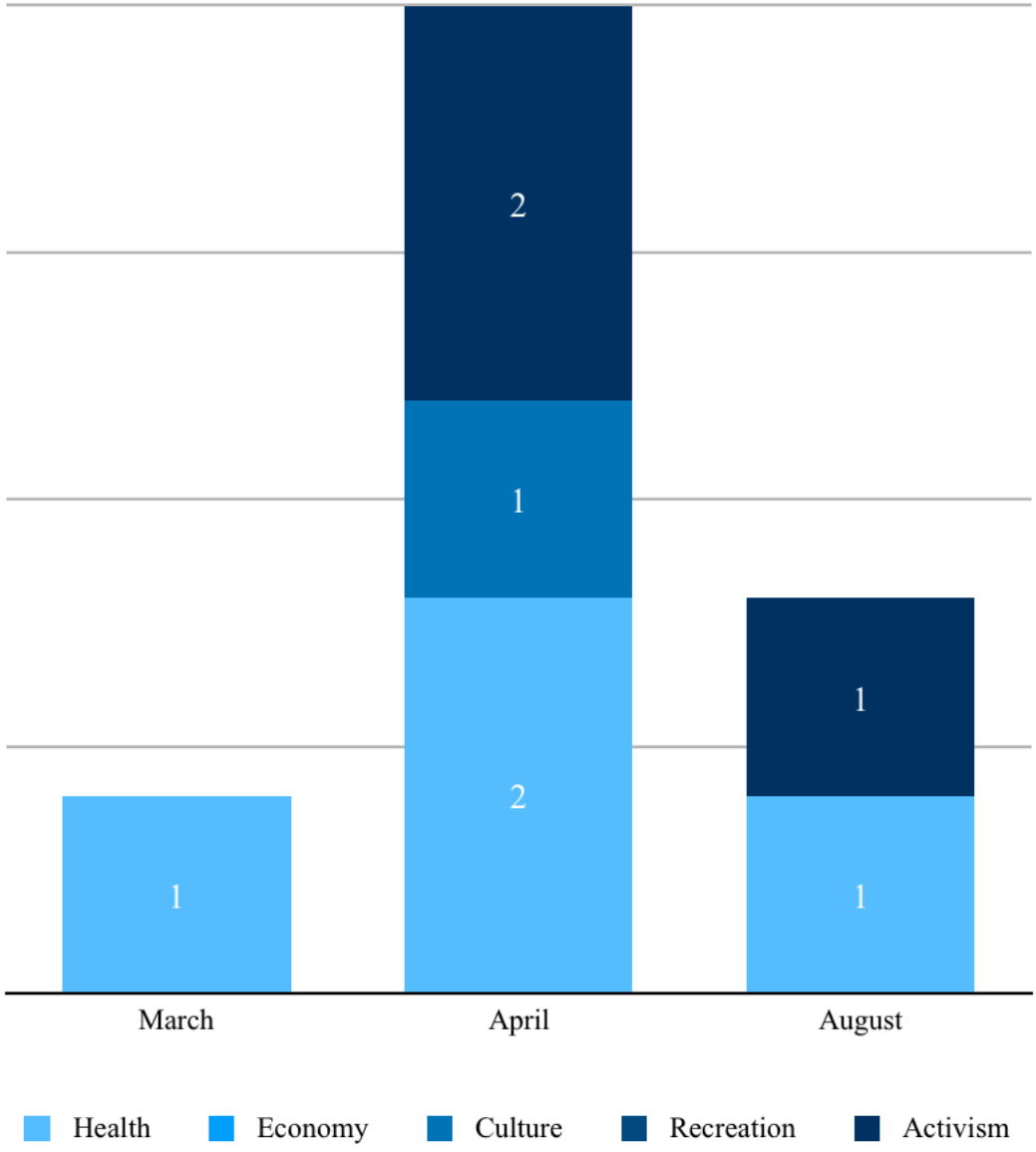
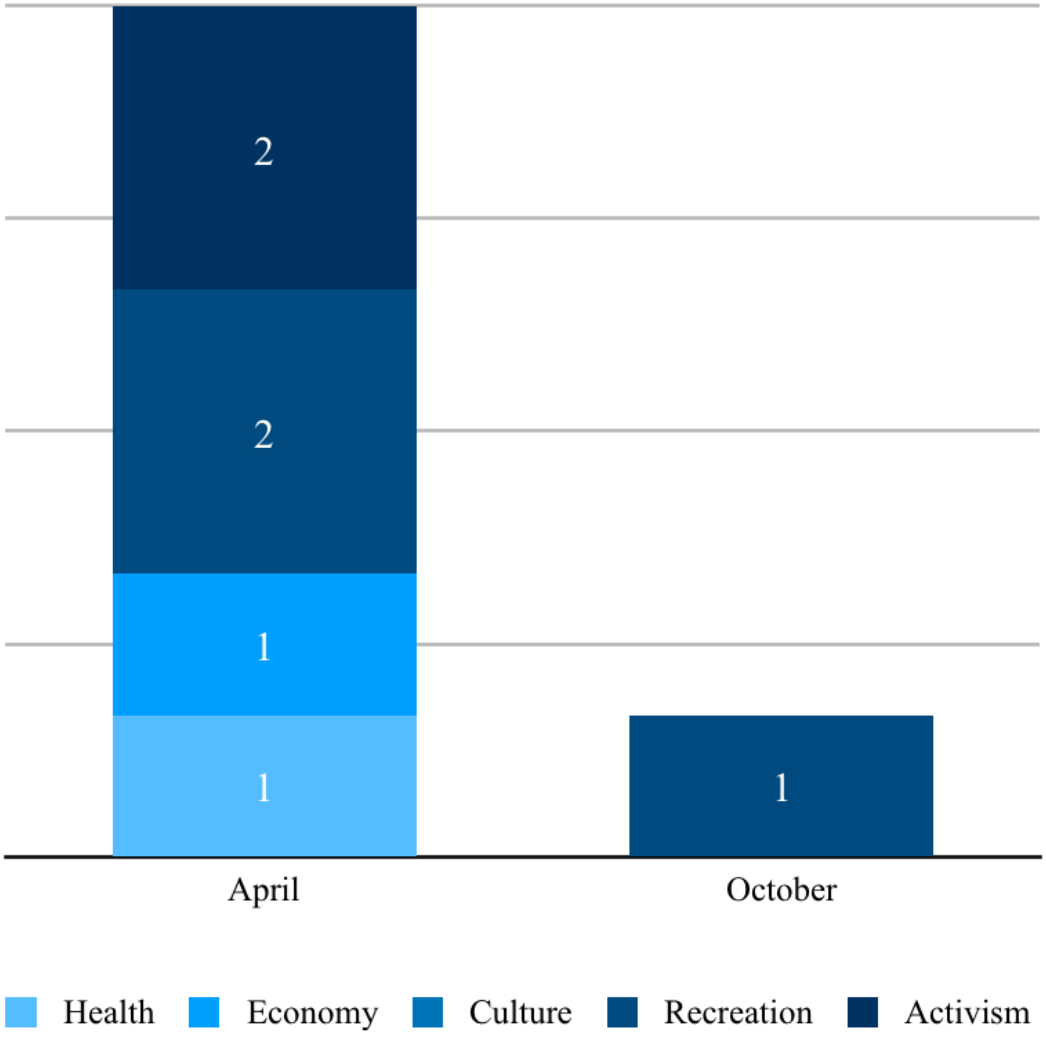


Figure 5: 2013 Frame Distribution by Month



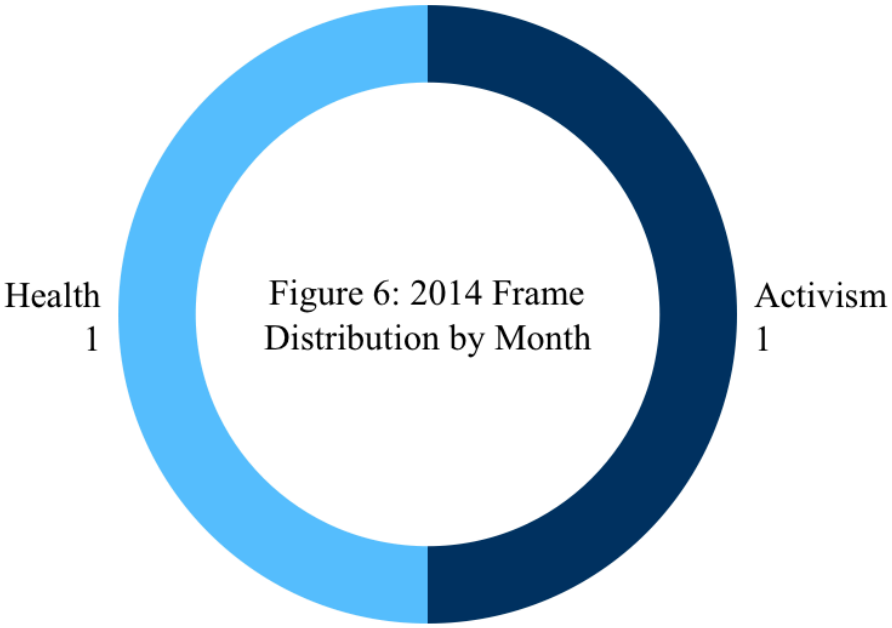


Figure 6: 2014 Frame Distribution by Month

Figure 7: 2015 Frame Distribution by Month

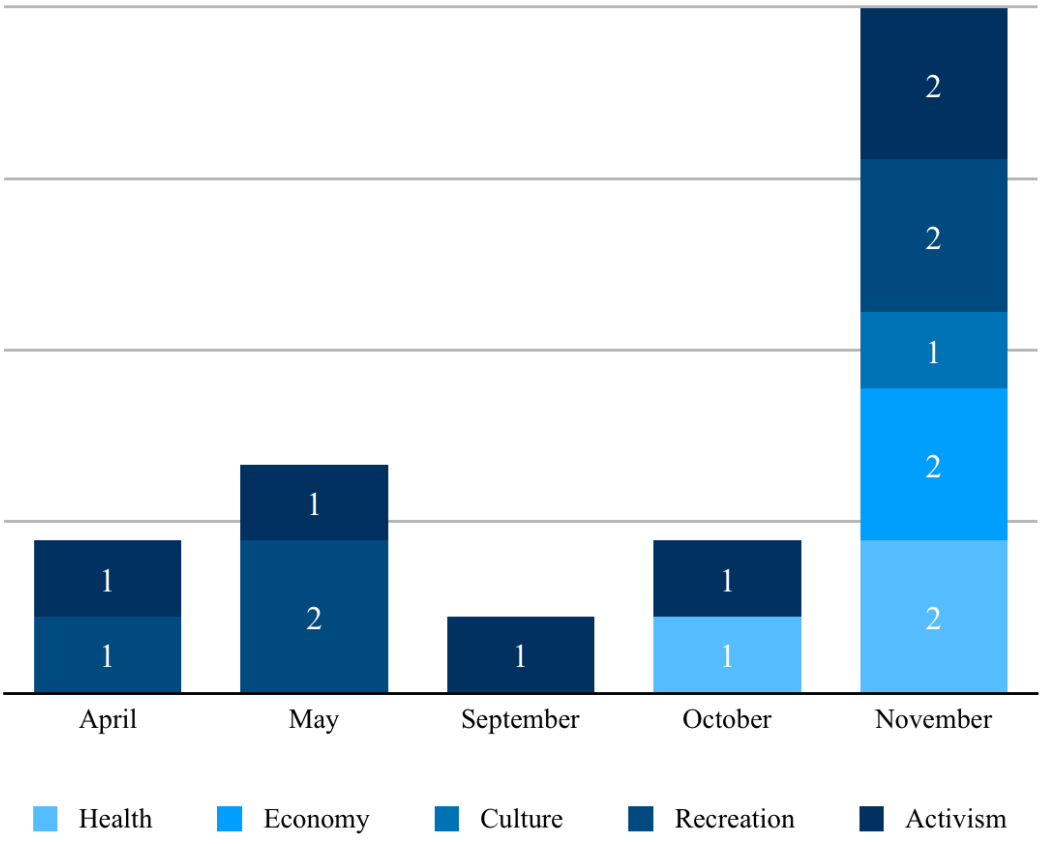


Figure 8: 2016 Frame Distribution by Month

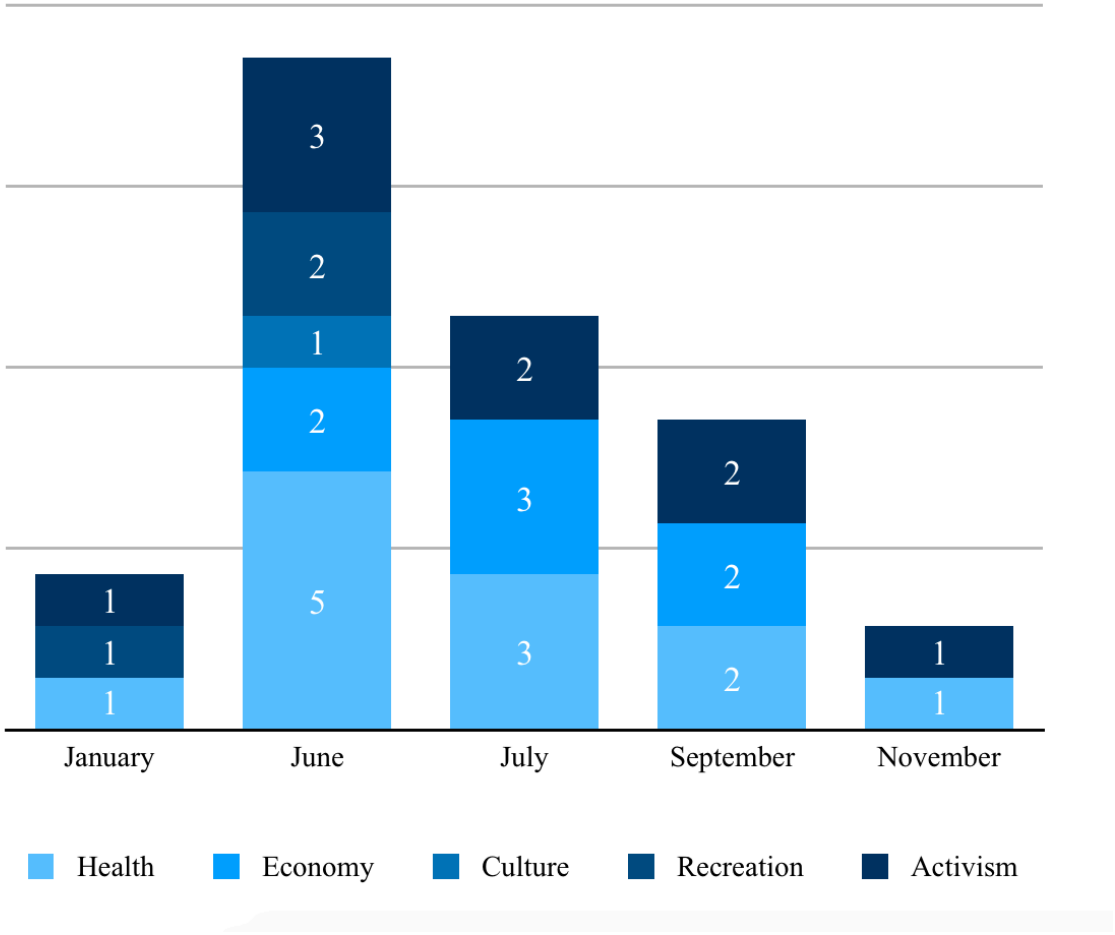


Figure 9: 2017 Frame Distribution by Month

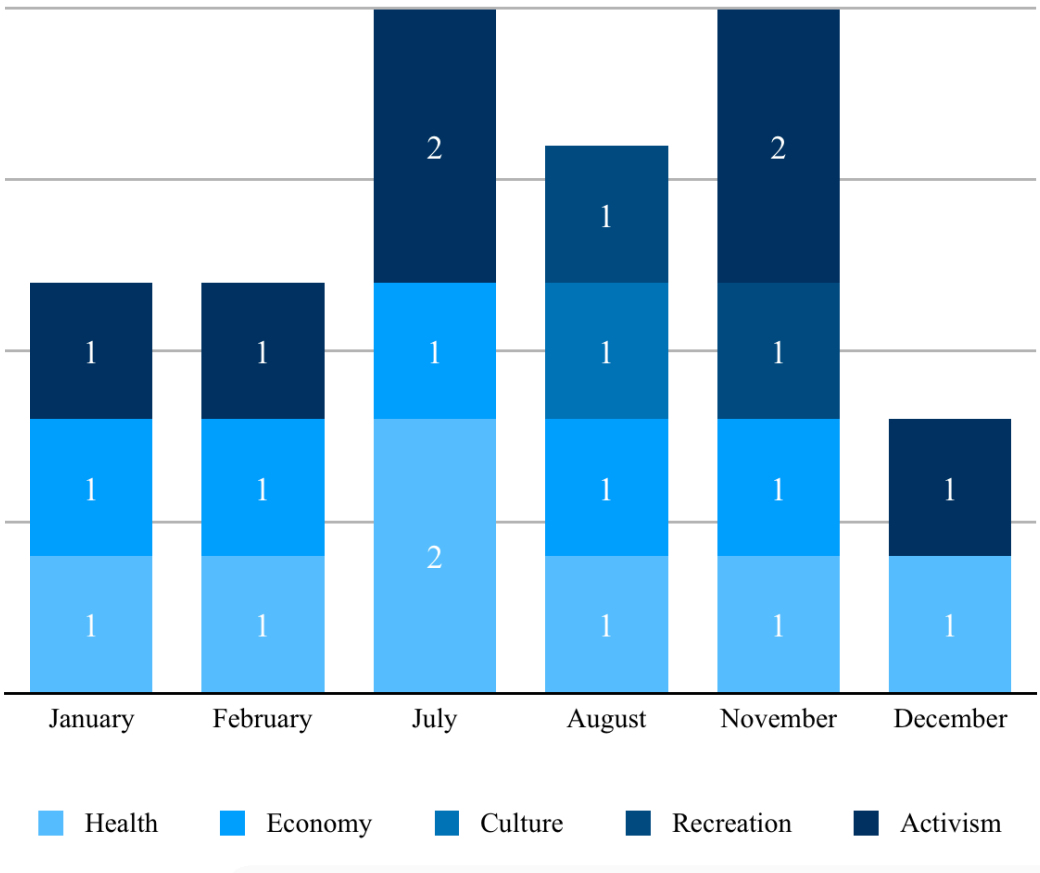
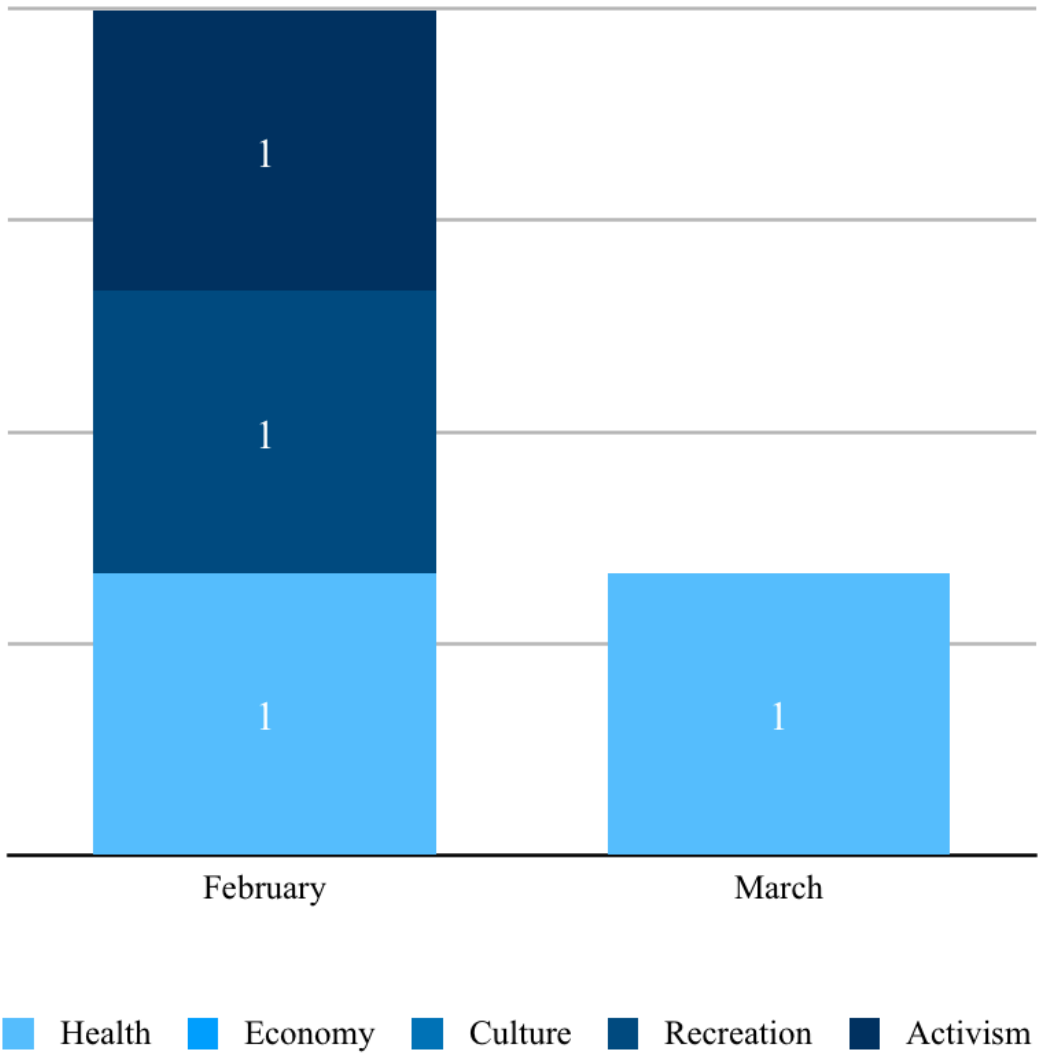


Figure 10: 2018 Frame Distribution by Month



Appendix D: Article Distribution by Month/Year