Discursive Narratives about Nuclear Power in the Aftermath of Fukushima: A Media Analysis on the New York Times and the Wall Street Journal

Danika Desai

ABSTRACT

On March 11th, 2011 a 9.0 earthquake struck of the coast of Japan followed by a 14 meter tsunami, resulting in the meltdown of three nuclear reactors at the Fukushima Daiichi nuclear power plant. The nuclear disaster garnered an abundance of media attention in the US. This study examines coverage of the Fukushima disaster in the New York Times and Wall Street Journal, focusing on how discourse about nuclear power has changed over the last 60 years, and how the discourse is related to the sources newspapers use for the content of their articles. After randomly selecting 57 articles from the NYT and 50 articles from the WSJ, I counted all the direct and indirect quotes within both newspapers to assess the sources from which the newspapers were drawing. I then coded the articles based on Gamson and Modigliani's definitions of discursive packages, and performed a chi square test to see if there was a relationship between sources used and packages portrayed. I found that both newspapers used primarily authoritative sources: regulatory, governmental, and industry officials. In addition, I found that rather than giving rise to new debates about nuclear power, the disaster served as a focusing event, and old arguments and packages about nuclear power resurfaced. Packages were modified to incorporate this latest event in the history of nuclear power. In general, all packages have become more similar, and certain assumptions have been adopted by both pro and anti-nuclear packages.

KEYWORDS

Disasters, packages, media sources, nuclear discourse

INTRODUCTION

On March 11th, 2011 a 9.0 earthquake struck off the coast of Japan followed by a 14 meter tsunami, resulting in the meltdown of three nuclear reactors at the Fukushima Daiichi nuclear power plant. The nuclear disaster garnered more media attention in the United States than the damage from both the earthquake and the tsunami (Friedman 2011). This is not surprising given the political significance of the American nuclear industry, which currently has 104 active nuclear reactors (Butler et al. 2011). Like other nuclear disasters such as Three Mile Island (TMI) and Chernobyl, the Fukushima nuclear disaster served as a focusing event, concentrating public attention around the issue of nuclear power (Gans 1979). The media attention surrounding a focusing event can be a precursor to policy change (Birkland 1997, Sood et al. 1987), and the direction of that change is at least partially shaped by how the media frames the disaster and the surrounding issue. News stories about disasters become "part of the rhetoric of future public and policy debates on these particular risk-related issues" (Sood et al. 1987). Because disasters re-open the debate over particular issues, and allow new perspectives to compete with dominant narratives (Gamson and Modigliani 1989), it is interesting and relevant to discover how these narratives about Fukushima are shaping public perceptions regarding nuclear power.

There are several examples of nuclear disasters that transformed public debate about nuclear power. For example, serious problems at nuclear plants that occurred before the TMI accident in 1979 were overlooked in the media because none of the counter-narratives offered by the anti-nuclear movement of the 70s had gained traction in the mainstream media (Gamson and Modigliani 1989). After TMI, even inconsequential nuclear incidents were reported in the news. In short, the disaster brought attention to the issue and re-opened the debate, allowing for the discussion of new positions and storylines (Mazur 1990). Thus the media has a role in choosing which narratives and perspectives are portrayed to the public, but this role is dependent upon the information and sources that journalists are drawing on for the content of their reports.

Journalists rely on authoritative sources to construct stories, and this dependence is increased when scientific jargon must be translated into more accessible language. Because scientific jargon is hard for the public to understand, the importance of factual evidence relies on how it is framed and signifed by "experts." Industry and government officials who make policy

decisions about nuclear power regulation and development may comprise as much as 78% of media sources cited in press coverage of nuclear disasters (Sood et al. 1987). In the case of the Exxon Valdez Oil Spill, the mainstream media interviewed authoritative sources such as government and industry officials but did not interview Alaskan natives greatly affected by the accident, therefore representing only the dominant culture's perspective on the accident (Widener and Gunter 2007). This illustrates how reliance on authority can lead to ethnocentrism in the media (Ploughman 1995), and can reinforce official narratives. Authoritative sources can also control information by withholding it. After Chernobyl, officials released almost no information, inducing panic among the public (Stsiapanau 2010). Even when officials knew what was going on, they did not like to report bad news (Rubin 1987). Radiation levels are also difficult to report because nuclear science terminology is not well understood by the public, which increases the media's dependence on officials who can translate the technical jargon into lay terms (Friedman et al 1987). Thus the packages that journalists represent are at least partially constructed by the sources they use, and since disasters are so heavily covered in the news, these packages have a great impact on public discourse.

In 1989, sociologist William Gamson and social psychologist Andre Modigliani conducted an extensive media analysis on nuclear energy discourse over a 30-year period, identifying six "packages," defined as the "metaphors, catchphrases, visual images, moral appeals, and other symbolic devices that characterize…discourse." Recently, nuclear power has been touted as a clean, cost affective means to secure the world's energy needs by several organizations. The 2005 Energy Policy Act, for example, included nuclear power as a way to secure future energy demands while decreasing emissions for the first time in nuclear power policy. In addition, an increasing amount of pro-nuclear editorials have appeared in many newspapers including the NYT and the WSJ (Dipalma 2010). This renewed enthusiasm for nuclear power has translated into 30 recent nuclear plants proposals and billions of dollars set aside for their construction—the most money since the late 1970s (Culley et al. 2010). Public discussion about nuclear power is essential because the nuclear industry is entrenched in American policy-making institutions due to the dual nature of the government as regulator and developer of nuclear technologies (Birkland 1997). For example, the Nuclear Regulatory Council (NRC) receives 90% of its funding from the nuclear industry, and 50% of NRC employees stated that questioning standard safety measures would negatively influence their careers (Kaufman and

Penciakova 2011). Because regulation is so tied to industry, public awareness is necessary for any type of policy action that challenges industry interests. Indeed, Gamson and Modigliani's *public accountability* package, which frames the nuclear industry as promoting profits at the expense of public safety, was the strongest anti-nuclear package in the media and also resonated most with the general public (Pollock et al. 1993). This suggests that the recent political unrest directed against corporatism (the occupy wall street movement, for instance) will raise another issue within the nuclear debate: whether the development of nuclear power is fair for the taxpayer. The disaster at the Fukushima Daiichi plants in Japan will affect packages about nuclear power just as TMI and Chernobyl did, especially since it happened at a site with many similarities to US plants. The Daiichi plant is an American plant design within a country known for technological achievements and within a system known for its close industry-government ties (Cooper 2011). Converging with a possible "nuclear renaissance" and heightened public awareness about corporate accountability, Fukushima provides a fresh opportunity to look at how different actors are telling the nuclear power narrative, and to determine how it has altered discourse in the American media about nuclear power, 30 years after TMI and 25 years after Chernobyl.

The objective of this research is to answer the following questions: how has the Fukushima nuclear disaster altered narratives about nuclear power in the American media? Are new narratives developing? I will examine which sources are given voice in the media (i.e. which types of sources are interviewed more often. I will document which source groups are telling which narratives, and how the media portrays these source groups. Because the media both educates the public, (Culley et al. 2010), and also serves as a bridge between inaccessible scientific jargon and the lay person, it is imperative to discover which voices and stories the media represents particularly on issues that are ripe for policy change.

METHODS

Background

After the three nuclear reactors at Fukushima Daichi (Fig. 1) melted down large amounts of radiation were released into the environment including 100,000 MbQ km^2 of ^{137}Cs[1] in Fukushima prefecture alone (Yasunari et al 2011). The total amount of Xenon was twice that released in Chernobyl. The total amount of ^{137}Cs was half that as much of Chernobyl (Brumfiel 2011).

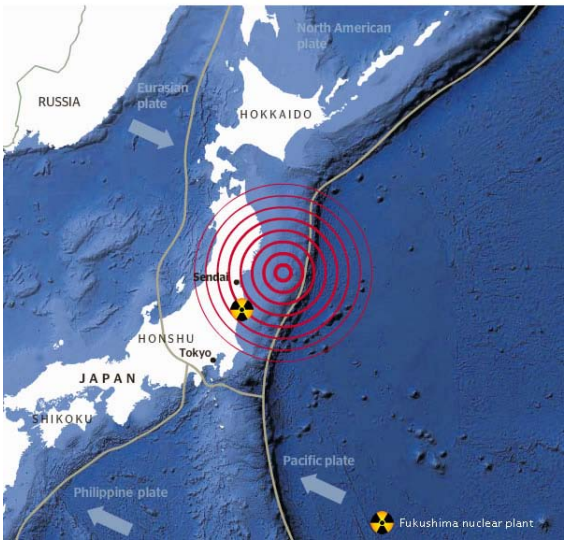

Fig. 1. Map. Tohoku earthquake epicenter and Fukushima nuclear power plant

Identifying Media Sources

To sample reporting on the Fukushima Daiichi nuclear disaster, I randomly selected 57 articles from the New York Times (NYT) and 50 articles from the Wall Street Journal (WSJ). Using LexusNexus for the NYT and Factiva for the WSJ, I searched every article, excluding editorials, which contained the word "Fukushima," and downloaded every 10^{th} article published

[1] A Megabequerel is the SI unit to measure radioactivity. It is the amount of radioactive activity that one decaying nucleus gives off per second. ^{37}Cs is a type of radioactive cesium that was released after Fukushima. It is considered dangerous because it stays in the environment for 30 years and causes health problems in humans.

between March 12th, 2011 and March 12th 2012. If an article just mentioned Fukushima in passing, I discarded it and downloaded the next article.

To determine which actors were most represented in these two newspapers, I counted the number of direct and indirect quotes attributed to different sources within articles. I divided sources into the following categories: industry officials, government personnel, independent experts, regulatory agencies, activists, workers, victims, business professionals and miscellaneous. I counted each quote as an individual unit using the word that described what was being quoted (e.g. "said," "claimed," "told," "reported," "announced," etc). I tagged the quotes by source group within a computer program called TAMS (text analysis mark-up system), which organized tagged passages and calculated totals. I also looked at the commentary portion of the articles, and coded that for packages as well.

Identifying Packages

Based on Gamson and Modigliani's (1989) typology (Table 1), I coded packages in the 107 randomly selected articles using TAMS. I identified packages using Gamson and Modigliani's descriptions of the common phrases, words, and metaphors that characterize specific packages. I tallied the number of coded passages representing each package to discover which were most prominent in each newspaper.

Table 1. Descriptive Overviews of Packages

Package	Description
Progress	Frames nuclear power as essential to economic growth and technological development
Energy Independence	An offshoot of *progress* that underscores nuclear power's role in providing independence from foreign oil
Runaway	Frames nuclear power fatalistically, in terms of resigned acceptance
Devil's Bargain	Juxtaposes *runaway* ambivalently with the benefits of nuclear power
Public Accountability	Critiques the corporate model of nuclear power production
Not cost effective	Critiques the growing expense of nuclear power
Soft paths	Critiques the hazards that nuclear power poses to nature, and advocates for the use of renewable technologies

Drawing on Norman Fairclough's *Analyzing Discourse* (2003), I developed 11 questions about catchwords, phrases, grammatical constructions, metaphors, tone, frames, imagery, diction, and narrative (Appendex A) in order to help me characterize packages. For example, the *progress* package uses metaphors that make nuclear power seem safe and friendly, such as claiming that

nuclear reactors operate at temperatures "no hotter than a kitchen oven." I used TAMS Analyzer for Mac to identify key words and common phrases.

Linking sources to packages

After tagging both source groups and packages in TAMS, I counted how many times each source portrayed each package. For example, in TAMS I searched for all quotes by industry officials that I had also coded as *progress*. I did this for each source group in relation to each package. I performed a chi-squared analysis using these two categorical groups to determine if there was any statistical correlation between sources and packages. I also analyzed how packages had changed since Gamson and Modigliani's study in 1989, by examining how and by whom the packages were used.

RESULTS

Identifying Sources

I found 230 direct quotes and 351 indirect quotes in the NYT and 130 direct quotes and 239 indirect quotes in the WSJ. In this sample, both newspapers primarily referenced government personnel and regulatory agencies, whereas workers and victims were rarely quoted in either newspaper. The NYT quoted about twice as many independent experts as the WSJ (Figs. 1 and 2).

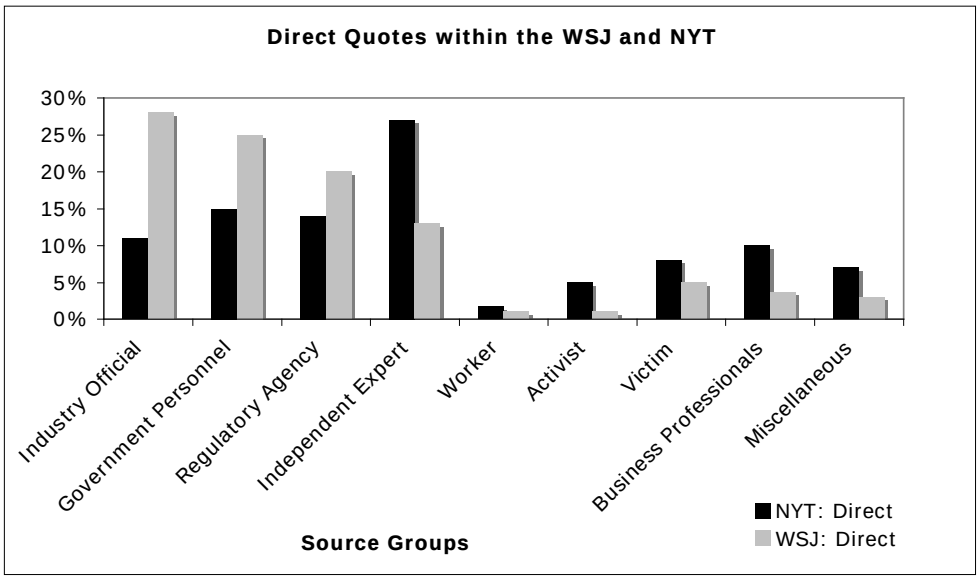

Figure 1. Direct Quotes by Source Group.

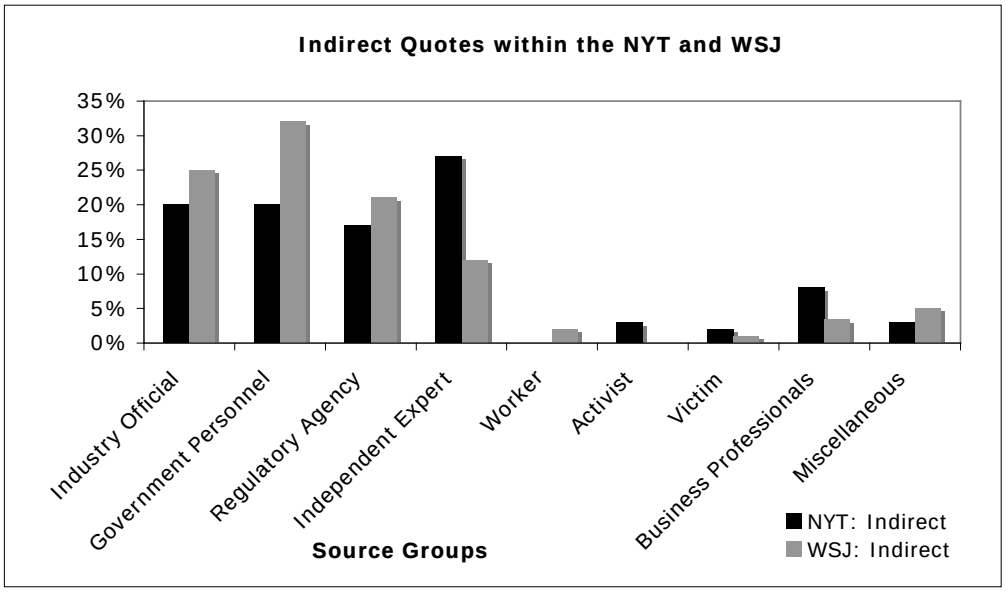

Figure 2. Indirect Quotes by Source Group.

Identifying and Characterizing Packages

I found each of Gamson and Modigliani's (1989) 7 packages represented in the total sample as well as a new packages developed since 1989, which I have dubbed *sustainability*, which frames nuclear power as a solution to the climate crisis, providing a clean form of energy that can also meet the public's demand. The latest form of the *progress* package frames Fukushima as an opportunity to learn lessons and therefore improve the nuclear industry and

nuclear technology. It claims that the lessons learned from the disaster will strengthen the safety and efficiency of existing nuclear power plants.

One argument that appears repeatedly in both newspapers is the idea that the meltdown was either the result of problems specific to the Japanese nuclear industry or, conversely, has large ramifications for the American nuclear industry due to similarities between the two systems. I have coded the two sides of this argument as *comparison-same* or *comparison-different* even though it does not necessarily have all the characteristics of a package ("metaphors, catchphrases, visual images, moral appeals, and other symbolic devices"). It is sometimes used in conjunction with *public accountability* especially when the emphasis is on how different the two regulatory systems are.

I found 141 examples of packages in NYT articles, and 109 in the WSJ. These packages were represented both within quotes from source groups and within the commentary portion of the articles. The package most prevalent in both newspapers was *progress,* occurring 43 times in the NYT and 38 times in the WSJ. *Public accountability* also occurred relatively often with the NYT containing 32 examples and the WSJ containing 21 examples. *Runaway* followed third, appearing 16 times in the NYT and 15 times in the WSJ. The other packages were relatively rare, accounting for less than 10% of the coded packages in both newspapers. (Fig. 3).

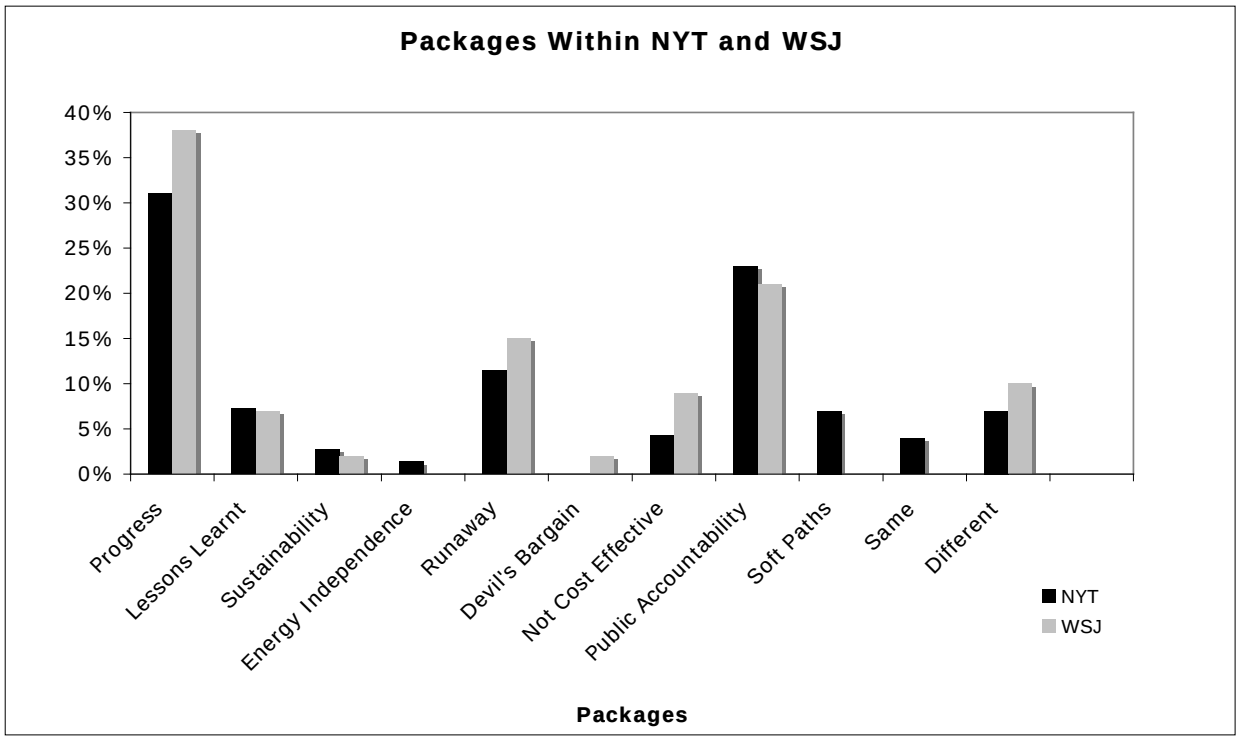

Figure 3. **Distribution of Coded Packages .**

In the table below (Table 2), I have given examples from the articles that portray the packages described in the methods and mentioned in the previous results section.

Table 2: Examples of Packages from Text.

Stance	Package Name	Examples
Pro-Nuclear Packages	*Progress, Lessons Learned*	"While defending the adequacy of U.S. regulations governing nuclear reactors, Mr. Jaczko acknowledged the need to learn lessons from the unfolding crisis in Japan would create a "severe workload" for his agency
	Energy Independence	"There's a policy question that needs to be answered: do we as a nation want to be independent of foreign sources of energy?"
	Sustainability	'I personally believe that nuclear energy must be part of any portfolio of renewable energy sources that will fuel this country moving forward,"
Ambivalent Packages	*Runaway*	"It's like the spinning wheels on a slot machine," David Lochbaum, the author of the report and the director of the organization's nuclear safety program, said in a prepared statement. "One ingredient showing up causes a puddle on the floor. Two ingredients yield a near miss. All three ingredients showing up can cause nuclear disaster."
Anti-Nuclear Packages	*Public Accountability*	In a country famed for stoicism, there is a quiet, mounting sense of anger toward Tokyo Electric Power Co., which operates the nuclear-power plant. Mr. Iwasa, now 82 years old, accuses the government of playing down the risks. "They're saying there was a leakage, but that it won't affect the human body. They're just fooling us."
	Not cost effective	'The safety is no question," Dr. Xu said, "but the economics are not so clear.

	Soft paths	"Once again, Mother Nature is warning us that nuclear power is the most brittle of electrical power systems."
Comparison	*Same*	"After Chernobyl, many said such an event could not happen in the U.S., because the Soviet Union's nuclear sector was not as advanced as our own," Mr. Waxman said. "But Japan is a highly developed country. It is as technologically sophisticated as us, and there's much concern in the U.S. that a similar accident could [happen] here."
	Different	"The Tennessee Valley Authority opened the doors to its Browns Ferry nuclear plant on Friday to present perhaps the most detailed case so far that American reactors of the same design and vintage as the ones damaged in Japan do not face the same risks."

Linking Source Groups to Packages

After performing a Chi square analysis, I found that source groups and packages were not statistically independent with a p-value of 7.712e-11. Thus, certain source groups were highly correlated with certain packages (Fig. 4). Government, regulatory, and industry officials all portray *progress* most often, by a fairly large margin. Independent experts also portray *progress* often, but *public accountability* is a close second and most of the packages are portrayed at least a few times within this source group. Remarkably, the journalist commentary portion of the articles most often portrays *runaway* followed closely by *public accountability.*

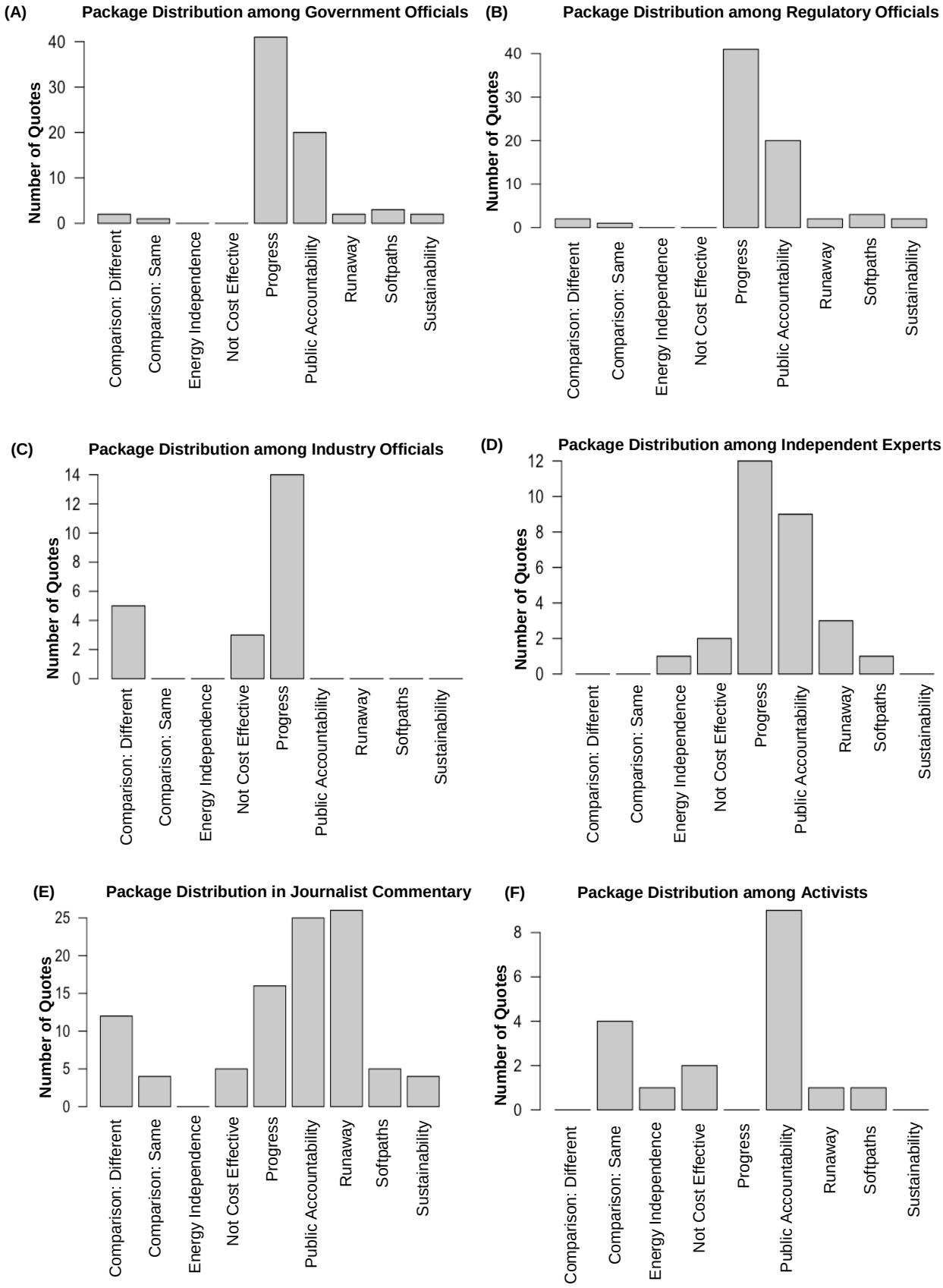

Figure 4. Distribution of Packages by Source Group.

DISCUSSION

The aftermath of the Fukushima disaster produced an enormous amount of media interest with the WSJ and the NYT each published over 500 articles about the accident. In fact, there was more news coverage about Fukushima than either TMI or Chernobyl, and reporting on the nuclear catastrophe far overshadowed reporting on the Tohoku earthquake and the following tsunami (Friedman 2011). Rather than giving rise to new debates about nuclear power, however, the disaster served as a focusing event (Birkland 1997), and old arguments and discourses about nuclear power resurfaced (Butler et al. 2011). The packages described earlier were modified to incorporate this latest event in narratives of the history of nuclear power. The same authoritative sources (government, regulatory, industry officials) that are usually cited by the mainstream media were used as sources, and those typically not quoted (workers, the native population, etc.) were excluded for the most part (Mazur 1990, Widener and Gunter 2007). Notably, all packages have become more similar, and certain assumptions have been adopted by both pro and anti-nuclear packages.

Media Sources

Both newspapers primarily referenced industry, government, and regulatory officials, whereas workers and activists were mostly excluded from the discourse. After Chernobyl the media relied heavily on official sources, with some surveys finding that 78% of all sources were attributed to some type of "official" (Sood et al 1987). Although my results were not quite as dramatic, it is clear that journalists continue to rely heavily on officials, and prefer authoritative sources. Authority bias is a journalistic norm that often dictates how journalists approach reporting, consulting only authority figures such as "government officials, business leaders, and others who reassure the public that order, safety, and security will soon be restored (Boycoff and Boycoff 2007)." The heavy use of authoritative sources legitimizes society's power structure and gives news stories validity in the eyes of the public, even if the facts are unclear (Perko et al. 2011). The prominence of "officials" cited in newspapers was not unexpected. Large organizations such as federal bureaucracies and corporations often have personnel dedicated to handling the press. Likewise journalists have pre-existing relationships with these personnel

from whom they can get current information on relevant issues (Tan Eyck and Williment 2004). However, the use of authoritative voices might be due not only to conventional reporting because workers were forced to sign contracts promising to remain silent about their work with TEPCO (The Economist 2011). Still, alternative and foreign news sources managed to interview workers present during the meltdowns only a few weeks after the accident (McNeil and Adelstein 2011).

Although both newspapers used authoritative sources, there were several differences between the two newspapers regarding which sources they used and how they used them. The NYT, for example, used twice as many direct quotes in total than the WSJ. Likewise, the NYT had 3 times as many indirect quotes as the WSJ. This suggests that the NYT displayed greater "dialogality," meaning that different viewpoints from a wider range of contexts were presented within the articles. Several WSJ journal articles had no quotes at all, suggesting a more authoritative, dictatorial approach (Fairclough 2003). In addition, the NYT quoted four times as many independent experts as the WSJ, indicating that the NYT though careful to uses sources viewed as legitimate in the eyes of society, tried to find at least some of these sources outside of the main power structure of industry, government, and regulatory bodies.

Packages: Narratives of Responsibility

Progress

Progress, the first and most prominent pro-nuclear power discursive package, has changed greatly since its beginnings in the early 1950s, but it remains prominent in both newspapers. There are several reasons why *progress* has remained so prominent over the sixty years of nuclear power history. *Progress* was strongly correlated to quotes from industry, regulatory, and government officials, groups that are heavily invested in maintaining the nuclear industry and which were most often cited by both newspapers. Since these groups were quoted most often in articles, it is not surprising that a message that strengthens their position was represented the most. The boundaries between these three source groups are flexible, and have been since the inception of the industry in the 1940s (Duffy 1997). While *progress* dominated discourse about nuclear power for years with optimistic phrases like "energy too cheap to meter" and "our friend the atom," the accidents at TMI and Chernobyl took their toll. Afterward,

progress had "shrunk to a mere 18% and frequently ha[d] a grudging and defensive tone" (Gamson and Modigliani 1989). The *progress* package in modern discourse has a similar defensive tone. Rather than epitomizing nuclear power as the pinnacle of modern civilization, which will carry society into the future by providing for all of humanity's energy needs, *progress* frames the accident as an opportunity for the NRC to become a more effective regulating body. Often officials spoke about how Fukushima was an opportunity to "learn lessons" that would help improve the technology as a whole (Butler et al. 2011). Turning Fukushima into an opportunity to improve, makes it seem that the development of this technology is a continuous process and further development should be encouraged while safety, efficiency, and regulation is improved concurrently (Butler et al. 2011). This transition from a progressive perspective to a polemic debate is common for media coverage of many new technologies. Only until events occur that dramatically alter the progressive storyline are dissenting opinions aired in the news (Ten Eyck and Williment 2004).

Because the *progress* package is now framed more as in terms of defending the technology than trying to promote it, *progress* has shifted from a pro-nuclear package to a more complex ambivalent narrative. For example, critics of nuclear power sometimes used the catch-phrases and terminology of the *progress* package. This immediately places the critic's position in the realm of *progress*—because it is actually a pro-nuclear statement, agreeing that nuclear power is feasible if a few kinks in the technology are straightened out. While it might be a strategic position for stalling the promotion of nuclear energy, it does not question the validity of the technology itself. For example, Representative Ed Markey (D-Mass.), who is often held up as the most prominent anti-nuclear politician stated that "In the wake of the Fukushima meltdown, the N.R.C. also should suspend all of its licensing decisions on new designs, new reactors or relicense applications until it incorporates the lessons of the Japanese catastrophe" (Wald 2011). This type of acceptance that nuclear power is an inevitable part of American energy sources seems to underlie most of the packages represented.

Public Accountability

Public Accountability was and still remains the most prominent anti-nuclear package in the media. There are several reasons why *public accountability* has remained so popular within

the discourse. One is the structure and history of the nuclear industry within the U.S. The NRC, for example, has a history of laxity in imposing penalties for regulatory infractions. In the last 8 years, the NRC found 24 infractions of safety regulations, but not a single company was penalized under the law (Kaufmann and Penciakova 2011). In addition, the nuclear regulatory system is operating under legislation that is more than 30 years old (Bertero 2011). Finally, regulatory failure is fresh in the minds of both public and media, with recent examples of it seen both in the 2008 collapse of Wall Street and the 2010 BP oil spill (Kaufmann and Penciakova 2011). The system in Japan is similarly flawed. Just in 2008, the International Atomic Energy Agency (IAEA) had warned the Japanese government that Japan's reactors were vulnerable to earthquakes, but neither party did anything to improve the earthquake preparedness of the plants (Uekoetter 2012).

Gamson and Modigliani (1989) noted that by the end of their study, *public accountability* was most often portrayed in its strong form, meaning instead of just commenting on the ineptitude of industry and government, *public accountability* started to imply that there was an intentional effort to mislead the public for the sake of profit. Now, however, a weak form is more often used. There are many examples (especially closer to when the accident occurred) that describe the follies of TEPCO as the result of poor planning, incompetence, or miscommunication. On March 14th, 2011, only 3 days after the accident the WSJ wrote, "Tokyo's handling of the nuclear crisis -- which has veered between apparent competence at some times and seeming helplessness at others -- bodes ill as millions continue to suffer without basic necessities (Auslin 2011)." Later, however, censure of TEPCO and the Japanese government becomes more severe. In an article from February 16th, 2012, the NYT writes, "Japan's nuclear safety chief said the country's regulations were fundamentally flawed and laid out a somber picture of a nuclear industry shaped by freewheeling power companies, toothless regulators and a government more interested in promoting nuclear energy than in safeguarding the health of its citizens (Tabuchi 2012)." As time passes, more information becomes available to the media and news coverage generally becomes more accurate (Friedman 2011), so perhaps the intimate relationship between Japanese industry and government became more exposed with time. In addition, this critique comes from a government-assigned panel, giving it authority and legitimacy in the journalistic world.

In the articles, most of the passages that displayed the *public accountability* package did not come from quoted sources, but from journalist's commentary within the article. Government, industry, or regulatory officials rarely portrayed *public accountability* because it is precisely this package that is most commonly leveraged against these source groups. In some instances, particularly in the WSJ, the *public accountability* package was used in regards to TEPCO and the Japanese government, but in a negative comparison to the US government and industries:

> Faith in politicians is already eroding rapidly [In Japan]. Witness the back-and-forth between Japan and the West over how best to protect residents of the area around Fukushima. Japanese see their government issuing one set of guidelines, including a 20-mile exclusion zone, while also issuing a steady stream of contradictory statements about how serious the problem is. Meanwhile, Australia, Britain and the U.S. issue much stronger warnings to their own citizens living in Japan…" (Auslin 2011).

Both newspapers often characterize the Japanese nuclear industry and government as incompetent or not forthcoming, but then compare the Japanese system to the American one, highlighting the differences between the two systems and representing the U.S. in a positive light. Interestingly, just as *progress* is sometimes used by anti-nuclear critics, so too can proponents of nuclear power use the *public accountability* package. Implying that the accident was due to the incompetence of a bad regulatory structure of a certain country puts the blame for the accident not on the technology itself, but on the government and industry utilizing the technology.

Runaway

Runaway is portrayed fairly often within the articles. *Runaway* is a deeply ambivalent package. Although it is often anti-nuclear, it has a fatalistic attitude about nuclear power and the health effects of radiation (Gamson and Modigliani 1989). *Runaway* often emphasized the unknowns about nuclear power and radiation, or paints images of desperate TEPCO workers frantically trying (but perhaps not succeeding) in bringing the reactors under control:

> Companies involved in bringing the plant under control…work in a science-fiction landscape where jury-rigged robots survey forbidden zones and workers shrouded a blown-out reactor building with a covering that they maneuvered into place using electric fans and fit together like Lego blocks. But these advances were halting and perilous, underscoring a grim reality: Problems at Fukushima Daiichi remain immense. The looming cleanup effort, people on the ground say, is enormous (Dvorak and Obe 2011).

In this excerpt from the WSJ, the workers are described as losing the fight against escaping radiation, and the scene presented is nightmarish. Even the best, most up-to-date technology is

not enough to make the clean-up process go smoothly. In short, the implication here is that even the most qualified experts don't really know what they are doing. A quote by a nuclear engineer at a Japanese university summed it up. "We don't know what we should do," he said (Dvorak and Obe 2011). Although represented less often than both *progress* and *public accountability*, *runaway* was the most commonly represented package in the commentary portion of the articles. If the press indeed reflects the public attitude, than *runaway* is probably the package that the American public most strongly identifies with. In fact, Butler et al. (2011) state that public opinion towards nuclear power seems to be one of "grudging acceptance." This attitude is characteristic of the *runaway* package, and it is precisely this mentality that seems to underlie most of the other packages portrayed in the articles, as if *runaway* has seeped into all parts of the discourse, almost unintentionally.

Sustainability and Softpaths

With the increasing awareness of global climate change, nuclear power has recently been framed as a means of mitigating green house gas emissions. In fact, some surveys indicate that public opposition has lessened since the late 1980s precisely because of this "greening" of nuclear power (Pidgeon et al. 2008). Despite this trend, I found only one reference to nuclear power as a sustainable option in the NYT. In fact, I found that when nuclear power was associated with global warming, it was most often in a negative way more congruent with the *softpaths* package than with the *sustainability* package. For example, the NYT writes that,

> …hot water discharged by power stations can combine with rising air temperatures to warm rivers enough in the summer to threaten fish and plant life. But building plants on seafronts, where cold water is abundant, may be less attractive because of storms and rising sea levels linked to climate change (Kanter and Dempsey 2011).

Still, while the *sustainability* package only occurred one time in either newspaper, *softpaths* only occurred ten times. Due to the hype about global warming in the media, it seems odd that these packages are not more prominent, especially given the amount of academic literature examining this trend (Pralle and Broscolino 2011, DiPalma 2010, Garud et al. 2010). One reason for the lack of these packages may be the defensive posture the industry took after Fukushima. Rather than trying to promote new power plants, industry and regulatory officials are trying to convince the public that the operating plants are safe and necessary. Both of these packages were

completely absent from the WSJ as if the concept of global warming is shunned from that newspaper entirely. *Softpaths* emphasizes the power of nature, while highlighting safety concerns. When it does appear, it usually focuses on the growing problems of nuclear energy in the face of climate change (as the above excerpt demonstrates), and the damage to sea-life from radioactive water.

Limitations

There are numerous limitations that might have compromised the quality of this research and may limit its level of inference. First, I was the only person coding packages. Often, there are at least 3 coders, and if there is disagreement over a certain package, the third person will break the tie (Perko et al. 2011, Gamson and Modigliani 1989). Thus the research is limited by my own biases. Additionally, all research would be better with a larger sample, and my research is no exception. It would have been ideal to have a wider sample of newspapers and other media outlets. Certainly, this research cannot be applied to other modes of media such as TV, blogs, radio, and other Internet sources. These sources may not follow the same journalistic norms that are prevalent in newspapers such as adherence to balance and authority (Boycoff and Boycoff 2007). In addition, all of this research rests upon a long history of interconnecting actors, institutions, and events that are specific to the American political system, thus the findings might not be indicative of nuclear discourse outside of the United States. Finally, since I randomly picked every 10^{th} article (except when Fukushima was only mentioned in passing), my sample was weighted towards media from the beginning weeks of the crisis, when most of the news articles were published. In general, media coverage of an accident gets more accurate with time as information is more widely disseminated (Friedman 2011), but my sample is skewed towards the inaccurate.

Broader Implications and Future Study

This subject of research could not be more relevant or vital in the current political context and there are many possibilities for future research. When it comes to reporting on scientific material, specifically something as complicated and politically relevant as nuclear power, the

public cannot interpret on its own from scientific sources, so it becomes extremely important that the media interpret for the public. Thus, the media serves as the translator between the science/industry and the public (Tan Eyck and Williment 2004). It is therefore doubly important for all views and perspectives to be heard and considered. Uncovering which sources and people are interviewed most often and most thoroughly allows us to understand which voices are missing and to fill this gap in the future. In addition, a relationship between public views and media frames has been established (Butler et al 2011, Friedman 2011, Gamson and Modigliani 1989), but it remains unclear whether the views of the public influence the media or vice versa. This would be most interesting and useful to determine. Is the media just a reflection of public opinion? Or does it create public opinion? Finally, Gamson and Modigliani's concept of packages might not be the best way to discuss the themes present within discourse about nuclear power. A recent article published in the journal *Environmental History* used the term motifs instead, which were defined as narratives that "convey responsibility or lack thereof" (Hamblin 2012). I think this might be a more conducive way to look at nuclear power especially after a disaster because ultimately the press is trying to determine whom to blame for the disaster, and each package is trying to convince the public of what or who is to blame.

Conclusion

In accordance with a journalistic norm, both the WSJ and the NYT primarily used authoritative sources for the content of their articles, legitimizing the current power structure. Packages have shifted, as has the ultimate controversy over nuclear power. Currently, at least within these newspapers, there is no real debate over whether or not nuclear power should actually exist. Rather there seems to be a universal assumption that it must exist. Likewise, there is no joy and eager optimism about nuclear power, but instead reluctant acceptance of it. Gamson and Modigliani (1989) stated that *runaway* was an increasingly popular package at the end of the time period they examined. It seems as if *runaway,* and a general ambivalence about nuclear power is now the norm and all other packages are situated within this ambivalence. Thus *progress* is frames nuclear power not as the salvation for all of humanity's energy needs, but as a developing technology that is continuously being improved. Likewise, *public accountability* frames nuclear power not as an evil conspiracy between industry and government but as a

general incompetent system that must be put aright. Because the packages are set in this context of ambivalence, they are no longer strictly pro or anti-nuclear power. Nuclear power, both frames now seem to say, is here to stay.

REFERENCES

Auslin, Michael. "Will Grief Turn to Anger in Japan?," *Wall Street Journal* 18 Mar. 2011, A17 sec.

Bertero, A. 2011. The 2011 Tohoku Disaster and the Nuclear Incident at Fukushima: Comparative Review, Historical Analysis and Assessment of the Japanese Nuclear Regime. Hastings College: Advanced International Law Research Seminar.

Bickerstaff, K., I. Lorenzoni, N. F. Pidgeon, W. Poortinga, and P. Simmons. 2008. Reframing nuclear power in the UK energy debate: nuclear power, climate change mitigation and radioactive waste. Public Understanding of Science 17:145 –169.

Birkland, T. 1997. After Disaster: Agenda Setting, Public Policy, and Focusing Events. Georgetown University Press, Washington, D.C., USA.

Boykoff, M. T., and J. M. Boykoff. 2007. Climate change and journalistic norms: A case-study of US mass-media coverage. Geoforum 38:1190–1204.

Butler, C., K. A. Parkhill, and N. F. Pidgeon. 2011. Nuclear Power After Japan: The Social Dimensions. Environment: Science and Policy for Sustainable Development 53:3–14.

Brumfiel, G. 2011. Fallout forensics hike radiation toll. Nature News 478:435–436.

Cooper, M. 2011. The implications of Fukushima: The US perspective. Bulletin of the Atomic Scientists 67:8–13.

DiPalma, S. R. M. 2010. Toward the Greening of Nuclear Energy: A Content Analysis of Nuclear Energy Frames from 1991 to 2008. Publics Relations Society of America: Educators Academy Proceedings: 42-54.

Duffy, R. 1997. Nuclear Politics in America: A History and Theory of Government Regulation. University Press of Kansas, Lawrence.

Cooper, M. 2011. The implications of Fukushima: The US perspective. Bulletin of the Atomic Scientists 67:8-13.

Culley, M. R., E. Ogley‐Oliver, A. D. Carton, and J. C. Street. 2010. Media framing of proposed nuclear reactors: An analysis of print media. Journal of Community & Applied Social Psychology 20:497-512.

Fairclough, Norman. 2003. Analyzing Discourse: Textual Analysis for Social Research. Routledge Taylor & Francis Group, London.

Friedman, S. M. 2011. Three Mile Island, Chernobyl, and Fukushima: An analysis of traditional and new media coverage of nuclear accidents and radiation. Bulletin of the Atomic Scientists 67:55–65.

Friedman, S. M., C. M. Gorney, and B. P. Egolf. 1987. Reporting on Radiation: A Content Analysis of Chernobyl Coverage. Journal of Communication 37:58-67.

Gamson, W. A., and A. Modigliani. 1989. Media Discourse and Public Opinion on Nuclear Power: A Constructionist Approach. American Journal of Sociology 95:1-37.

Gans, H. 1979. Deciding What's News: A Study of CBS Evening News, NBC Nightly News, Newsweek, and Time. Northwestern University Press, Evanston, Illinois, USA.

Garud, R., J. Gehman, and P. Karnøe. 2010. Categorization by association: Nuclear technology and emission-free electricity Research. Sociology of Work 21:51–93.

Hamblin, J. 2012. Fukushima and the Motifs of Nuclear History. Environmental History 17:285–299.

Kanter, James, and Judy Dempsey. ""Germany Shuts 7 Nuclear Plants as Europe Plans to Hold Safety Tests in 27 Countries,"" *New York Times* 16 Mar. 2011, B: 1.

Kaufman, D., and V. Penciakova 2011. Preventing Nuclear Meltdown: Assessing Regulatory Failure in Japan and the United States. Brookings Institute: http://www.brookings.edu/opinions/2011/0401_nuclear_meltdown_kaufmann.

Mazur, A. 1990. Nuclear power, chemical hazards, and the quantity of reporting. Minerva 28:294-323.

McNeill, David, and Jake Adelstein. 2011. What happened at Fukushima? JapanFocus 9: http://www.japanfocus.org/-Jake-Adelstein/3585.

Obe, Mitsuru, and Phred Dvorak. "After Nuclear Milestone, a Long Road: Japan Plant's Operator to Hail 'Cold Shutdown'" *Wall Street Journal* 16 Dec. 2011, A15 sec.

Perko, T., C. Turcanu, and B. Carlé. 2012. Media Reporting of Nuclear Emergencies: The Effects of Transparent Communication in a Minor Nuclear Event. Journal of Contingencies and Crisis Management 20:52–63.

Pidgeon, N. F., I. Lorenzoni, and W. Poortinga. 2008. Climate change or nuclear power "No thanks!" A quantitative study of public perceptions and risk framing in Britain. Global Environmental Change 18:69–85.

Ploughman, P. 1995. The American Print News Media “Construction” of Five Natural Disasters. Disasters 19:308-326.

Pollock, P. H., S. A. Lilie, and M. E. Vittes. 1993. Hard Issues, Core Values and Vertical Constraint: The Case of Nuclear Power. British Journal of Political Science 23:29-50.

Pralle, S., and J. Boscarino. 2011. Framing Trade-offs: The Politics of Nuclear Power and Wind Energy in the Age of Global Climate Change. Review of Policy Research 28:323–346.

Rubin, D. M. 1987. How the News Media Reported on Three Mile Island and Chernobyl. Journal of Communication 37:42-57.

Sood, B. R., G. Stockdale, and E. M. Rogers. 1987. How the News Media Operate in Natural Disasters. Journal of Communication 37:27-41.

Stsiapanau, A. 2010. The Chernobyl politics in Belarus: interplay of discourse-coalitions. FilosoFija. Sociologija 2:143-150.

Tabuchi, Hiroko. "Japan Ignored Nuclear Risks, Official Says." *New York Times* 16 Feb. 2012, A: 11.

Ten Eyck, T. A., and M. Williment. 2004. The more things change …: milk pasteurization, food irradiation, and biotechnology in the New York Times. The Social Science Journal 41:29–41.

Uekoetter, F. 2012. Fukushima, Europe, and the Authoritarian Nature of Nuclear Technology. Environmental History 17:278–284.

Wald, Matthew L. "Regulators Find Design Flaws In New Reactors." *New York Times*, sec. B: 1.

Widener, P., and V. J. Gunter. 2007. Oil Spill Recovery in the Media: Missing an Alaska Native Perspective. Society & Natural Resources 20:767–783.

Yasunari, T. J., A. Stohl, R. S. Hayano, J. F. Burkhart, S. Eckhardt, and T. Yasunari. 2011. Cesium-137 deposition and contamination of Japanese soils due to the Fukushima nuclear accident. Proceedings of the National Academy of Sciences 108:19530–19534.

APPENDIX A

Article Questionnaire

1. What is the tone of the passage?
2. Are there certain frames for different positions or events?
3. How are big actors portrayed/characterized?
    a. Tepco, NRC, governments, etc
4. What type of metaphors are used?
    a. Are there euphemisms?
    b. Do they reference to frames
5. What images are invoked?
6. Are there any unusual grammatical structures in the text?
    c. Is passive voice used? Is passive voice used repeatedly for specific actions/actors/events?
6. What type of diction is used?
    a. What are the connotations of words used?
    b. Are certain words repeated frequently?
    c. Are certain words objects, subjects, modified by certain adjectives?
7. How is scientific language presented?
    a. Is it included as a quote from an expert?
    b. Is it translated into lay terms by the author?
    c. Is it specific or vague?
    d. Is it easy/difficult to understand?
    e. How do they talk about technology?
    f. How do they talk about professional knowledge?
8. What is the focus of the article?
    a. What is included/what is left out?
    b. Are major events/actors skimmed over or skipped?
9. How does this passage fit into the broader narrative?
    a. What is the inflection point?
    b. What are the morals represented in this narrative?
10. How many voices are included? What is the 'dialogality' of the text? Is in an appendix.
    a. If outside sources are used are they directly quoted or indirectly referenced?
    b. When quotations are used are they genuine or are they used to imply skepticism of the quoted words?
    c. Are multiple views presented? Do actors quoted have similar/different perspectives?

APPENDIX B

Title of New York Times Articles	Date	Author
13 Plants Felt Earthquake, But Reactors Were Spared	26-Aug-11	MATTHEW L. WALD
After a Quake, 2 Yardsticks for Nuclear Inspectors	21-Oct-11	MATTHEW L. WALD
Alabama Nuclear Reactor, Partly Built, to Be Finished	19-Aug-11	MATTHEW L. WALD
An Anniversary of 'Heartbreaking Grief' in Japan	12-Mar-12	HIROKO TABUCHI
An Energy Plan Derailed by Events Is Being Retooled	31-Mar-11	JOHN M. BRODER
Drumbeat of Nuclear Fallout Fear Doesn't Resound With Experts	3-May-11	WILLIAM J. BROAD
Efforts to Plug Japanese Reactor Leak Seem to Fail	4-Apr-11	HIROKO TABUCHI and KEN BELSON
Evacuations Ordered Near Two Nuclear Plants After Warnings of Small Leaks	12-Mar-11	MATTHEW L. WALD
Explosion at French Nuclear Site Leaves One Person Dead	13-Sep-11	STEVEN ERLANGER and NICOLA CLARK
Fears of Fission Rise at Stricken Japanese Plant	3-Nov-11	HIROKO TABUCHI
Fighting the Unthinkable: Japan's Furious Scramble to Contain Catastrophe	3-Nov-11	HIROKO TABUCHI
Filtering of Tainted Water Begins at Japanese Plant	18-Jun-11	KEN BELSON
Fresh Crisis Halts Nuclear-Plant Repairs	23-Mar-11	HIROKO TABUCHI, DAVID JOLLY, K. DREW
Germany Likely to Close Seven Nuclear Plants	28-May-11	JACK EWING
Germany Shuts 7 Nuclear Plants as Europe Plans to Hold Safety Tests in 27 Countries	16-Mar-11	JAMES KANTER and JUDY DEMPSEY
Gloomy After Earthquake, Toyota Predicts 31% Drop in Annual Profit	11-Jun-11	HIROKO TABUCHI
Greens Gain In Germany, And the World Takes Notice	2-Sep-11	NICHOLAS KULISH
IAEA Probes Accident In Japan	16-Mar-11	JAMES KANTER and JUDY DEMPSEY
In Shortage, Japanese Willingly Ration the Watts	29-Jul-11	NORIMITSU ONISHI
In Tour, U.S. Nuclear Plant Opens Doors to Make Case	27-Mar-11	MATTHEW L. WALD
Independent Panel Challenges Japan's Account of Disaster at Nuclear Plant	16-Jan-12	HIROKO TABUCHI
Indian Pt. May Enlist Giuliani as Defender	4-Aug-11	THOMAS KAPLAN and DANNY HAKIM
Investing in Energy (A Special Report)	4-Aug-11	THOMAS KAPLAN and DANNY HAKIM
Is This the Poster Food for a Radiation Menace?	12-Apr-11	DENISE GRADY
Japan Ignored Nuclear Risks, Official Says	16-Feb-12	HIROKO TABUCHI
Japan May Declare Control Over Damaged Reactors, but Skeptics Demur	15-Dec-11	MARTIN FACKLER
Japan Operator Shutting Down Nuclear Reactor After Malfunction	16-Jul-11	HIROKO TABUCHI
Japan Panel Cites Failure In Tsunami	27-Dec-11	HIROKO TABUCHI
Japanese Nuclear Plant Shuts Down After Cooling Problem	27-Dec-11	HIROKO TABUCHI
Japan's Nuclear Crisis Does Not Signal Urgent Changes for U.S., Regulators Say	22-Mar-11	MATTHEW L. WALD

Lives on Edges, Focused on the Quake Zone	20-Mar-11	T. WILLIAMS, A. SULZBERGER, E. FITZSIMMONS
Loan Request by Uranium-Enrichment Firm Upends Politics as Usual	25-Nov-11	MATTHEW L. WALD
NRG Abandons Project For 2 Reactors in Texas	20-Apr-11	MATTHEW L. WALD
Nuclear Agency Tells a Concerned Congress That U.S. Industry Remains Safe	20-Apr-11	MATTHEW L. WALD
Nuclear Backlash Energizes Old Plants	17-Mar-11	MATTHEW L. WALD
Nuclear Company to Compensate Evacuees in Japan	16-Apr-11	KEITH BRADSHER and ANDREW POLLACK
Nuclear-Agency Chief Urges Swift Action on Proposals for Reactor Safety	16-Apr-11	KEITH BRADSHER and ANDREW POLLACK{
President of Japan Nuclear Operator May Resign Over E-Mails	8-Jul-11	MARTIN FACKLER
Pressing Ahead Where Others Have Failed	8-Jul-11	MARTIN FACKLER
Radiation Fears Cloud Japan's Recovery	25-Mar-11	KEITH BRADSHER
Radiation's Unknowns Weigh on Japan	7-Jun-11	MATTHEW L. WALD
Radioactive Iodine Detected in Ocean, Despite Gains at Japanese Plant	1-Apr-11	DAVID JOLLY
Regulators Find Design Flaws In New Reactors	21-May-11	MATTHEW L. WALD
Report Gives New Details Of Chaos at Stricken Plant	12-Nov-11	MATTHEW L. WALD
Report Urges Storing Spent Nuclear Fuel, Not Reprocessing It	26-Apr-11	MATTHEW L. WALD
Rescuers Dig for Survivors, But Thousands Feared Dead	12-Nov-11	MATTHEW L. WALD
Revamped Search Urged For a Nuclear Waste Site	27-Jan-12	MATTHEW L. WALD
Screening the Day's Catch	6-Apr-11	WILLIAM NEUMAN and FLORENCE FABRICANT
Several Plant Workers Are Ill, but Radiation Risk in Japan Is Seen as Low for Now	14-Mar-11	DENISE GRADY
Shareholders Push Tepco to Abandon Nuclear Power	27-Jun-11	BLOOMBERG NEWS
Shares Tumble as Investors Worry About Japan	27-Jun-11	BLOOMBERG NEWS
Stress Test for the Global Supply Chain	20-Mar-11	STEVE LOHR
Tepco Credit Rating Cut to 'Junk	15-Mar-11	GRAHAM BOWLEY and BETTINA WASSENER
U.S. Investors Place Record Wager on Japanese Funds	24-Mar-11	GRAHAM BOWLEY
When All Isn't Enough to Stop a Catastrophe	29-Mar-11	J. BRODER, M. WALD and T. ZELLER Jr
With U.S. Nuclear Plants Under Scrutiny, Too, a Report Raises Safety Concerns	18-Mar-11	TOM ZELLER Jr.
Worries Grow as Experts Argue About Nuclear Dangers at Japan Plant	9-Apr-11	HIROKO TABUCHI and KEITH BRADSHER
Title of Wall Street Journal Articles	**Date**	**Author**
Corporate News: Fluor Buys Stake In Reactor Maker	13-Oct-11	Rebecca Smith
Corporate News: French Train China Nuclear Experts	29-Dec-11	Max Colchester
Corporate News: Nuclear-Plant Manager Is Ill	29-Nov-11	Mitsuru Obe
Corporate News: Toshiba Set to Buy Nuke Stake	6-Sep-11	Dennis K. Berman and Anupreeta Das
Corporate News: Utility Looks for Boost	16-Jan-12	Kana Inagaki
Disaster in Japan: Foreign Companies Step Up Evacuation Efforts	18-Mar-11	Susan Carey, Thomas M. Burton and Kenneth Maxwell

Disaster in Japan: Hiroshima's Legacy Heightens Fears	16-Mar-11	Mariko Sanchanta
Disaster in Japan: Nation Makes Gains in Nuclear Fight	21-Mar-11	Norihiko Shirouzu, Yuka Hayashi and Peter Landers
Disaster in Japan: Nuclear Plants Release Radiation	12-Mar-11	Yuka Hayashi and Rebecca Smith
Disaster in Japan: Plant Operator Seeks Billions in Loans	24-Mar-11	Atsuko Fukase
Disaster in Japan: Tests Conducted On U.S. Facilities	21-Mar-11	Stephen Power and Alan Zibel
Disaster in Japan: U.S., Japan Split on Zone Of Evacuation	17-Mar-11	Tennille Tracy and Jared Favole
Eerie Hush Descends On Japan's Nuke Zone	18-Apr-11	Daisuke Wakabayashi
Fresh Tales of Chaos Emerge From Early in Nuclear Crisis	18-May-11	Yuka Hayashi, George Nishiyama and Toko Sekiguchi
IAEA Probes Accident In Japan	25-May-11	Mitsuru Obe
Investing in Energy (A Special Report)	5-Dec-11	Brian Spegele
Invisible Menace: Murky Science Clouded Japan Nuclear Response	16-Aug-11	Yuka Hayashi
Japanese Plant Had Barebones Risk Plan	31-Mar-11	Phred Dvorak and Peter Landers
Managing Boss Talk: Chief Leads NRG From Nuclear to Solar, Gas	7-Mar-12	Leslie Kwoh
Nuclear Backlash Energizes Old Plants	8-Sep-11	Rebecca Smith
Nuclear-Agency Chief Urges Swift Action on Proposals for Reactor Safety	19-Jul-11	Ryan Tracy
Rescuers Dig for Survivors, But Thousands Feared Dead	14-Mar-11	William Sposato in Tokyo, Eric Bellman
REVIEW --- The Man Who Predicted the Tsunami	9-Apr-11	Peter Landers
Tepco Credit Rating Cut to 'Junk	21-Jun-11	William Sposato
U.S. News --- THE NUMBERS GUY: Radiation Math: How Do We Count the Rays?	23-Mar-11	Carl Bialik
}U.S. News: Bad Data Guided U.S. Fukushima Call	22-Feb-12	Peter Landers
U.S. News: Diablo Plant Delays License Bid for Quake Study	12-Apr-11	Ben Casselman and Stephen Power
U.S. News: Fire at Nuclear Plant Called Serious Threat	13-Mar-12	Tennille Tracy
U.S. News: New Risks for Nuclear Plants	1-Feb-12	Rebecca Smith
U.S. News: Problem of Where to Put Waste Continues to Dog the Industry	10-Jun-11	Ben Casselman
U.S. News: Safety Gaps Found at Nuclear Plants	16-May-11	Rebecca Smith
U.S. News: Storage of Waste Gets New Scrutiny	25-Mar-11	Stephen Power
U.S. News: U.S. Watch	13-May-11	
Will Grief Turn to Anger in Japan?	18-Mar-11	Michael Auslin
World News: After Nuclear Milestone, a Long Road	16-Dec-11	Phred Dvorak and Mitsuru Obe
World News: Beijing Says Its Reactors Are Safe	16-Jun-11	Brian Spegele
World News: Companies Vie for Plant-Closing Job	14-Apr-11	Juro Osawa
World News: Fateful Move Exposed Japan Plant	12-Jul-11	Chester Dawson and Yuka Hayashi
World News: France Lifts Nuclear-Safety Spending	28-Jun-11	Max Colchester
World News: Japan Imposes Ban on Nuclear Zone	21-Apr-11	Mitsuru Obe and Toko Sekiguchi

World News: In Japan, Provocative Case for Staying Nuclear	28-Oct-11	Chester Dawson
World News: Japan to Dismiss Three Nuclear-Policy Officials	5-Aug-11	Toko Sekiguchi
World News: Japan to Ease Evacuation Rules	30-Sep-11	Phred Dvorak
World News: Japanese Premier Pushes Nuclear-Plant Restarts	21-Sep-11	Yuka Hayashi, George Nishiyama and Toko Sekiguchi
World News: Officials Signal New Plant Worries	6-Apr-11	George Nishiyama and Mitsuru Obe
World News: Radiation Found In Groundwater At Japan Complex	1-Apr-11	Mitsuru Obe and Yuki Hayashi
World News: Ruling Party Hurt In Japan Election	25-Apr-11	Toko Sekiguchi
World News: Speculation Grows On Tepco Takeover	29-Mar-11	Brad Frischkorn and Yuka Hayashi
World News: Tokyo Lifts Ban on Shipments of Beef	26-Aug-11	Juro Osawa
World News: U.S. Criticized Tokyo's Nuclear Plan	9-Apr-11	Yoree Koh