

A QUALITATIVE EXPLORATION OF THE JAPANESE PUBLIC'S RESPONSE TO
THE FUKUSHIMA NUCLEAR DISASTER

by

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ABSTRACT
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This narrative content analysis was conducted to gain an understanding of the experiences and perspectives of the Japanese public and explore how individuals have responded to and been impacted by the Fukushima nuclear disaster. After application of selection criteria, content from one alternative media website – Fukushima Diary – became identified as a source of data in this study. In all, 841 single-spaced pages of data analyzed to further understanding of the public's cognitive, affective, and behavioral responses to the health threat posed by the Fukushima nuclear catastrophe resulted in identification of six themes arranged according to two dimensions. The first dimension, “when the impossible happens,” consists of three themes centered on the public's affective and cognitive responses: (a) a shock to the system, (b) increasing perception of threat, and (c) betrayal and systemic domination. The second dimension, “we have to save ourselves,” includes three themes highlighting the public's behavioral responses: (a) the mosquito and the dinosaur, (b) two kinds of people, and (c) a butterfly trying to move a mountain. Collectively, these six themes reveal how this disaster has impacted the wellbeing of those living in Japan and illuminate the centrality of culture and communication to the Japanese public's understanding of and response to this nuclear

catastrophe. Findings confirm the heuristic value of the EPPM and the five cultural dimensions in Hofstede's framework. As an emergent theory, Iori Mochizuki's self-hypnosis model provided a valuable lens for furthering understanding of how this disaster impacted the Japanese public. As suggested by this research, the Japanese response to the Fukushima nuclear disaster remains highly heterogeneous. While statistics on overall releases of radiation provide an essential objective measure of the severity and potential impact of the disaster, this study illuminates the value of examining detailed narrative accounts when seeking to understand the human toll of this catastrophe.

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“Do we all just sit and let it happen? Is that all we could do to look at children having their throat cut?”

- Fukushima Diary, *What is your Next Step*, March 2, 2013



Explosion of Reactor No. 3, March 2011

Chapter One

Introduction

The meltdown of three nuclear reactors following the March 2011 Great Tōhoku earthquake and tsunami poses an ongoing health threat to those living in Japan. As radiation from molten corium and spent fuel rods damaged in explosions and pool fires continues to spread unabated into the air, sea, soil, and groundwater, this ongoing nuclear catastrophe contributes to an increased risk of negative health outcomes for the Japanese populace. While airborne releases pose a significant threat of particular concern to those living or working in the vicinity surrounding the Fukushima Daiichi plant, internal exposure from contaminated food and water constitutes a danger far greater than external contamination, and as a result of bioaccumulation – the concentration of radiation in the food chain (Yablokov, Nesterenko, & Nesterenko, 2010), the risk of internal radiation exposure represents a significant health threat for everyone living in Japan.

Official declaration of a new state of emergency at Fukushima Daiichi in July 2013 (Wingfield-Hayes, 2013) resulted in increased press coverage focused on the unfolding Fukushima nuclear crisis in Japanese and international media. Tokyo Electric Power Company's (Tepco) admission of having little control over the situation at Fukushima Daiichi I, and the Japanese government's expressed concern that rising radiation levels may soon prevent continued work at the site (Mizuno, 2013) did little to reassure an already worried public.

While the intrinsic benefit of attending to the voices of ordinary citizens affected by natural and anthropogenic disasters is widely recognized, few studies have focused primarily on the human consequences of technological disasters, and little research has

been conducted on how individuals respond in the face of a chronic technological crisis event (Tyler, 2005; Waymer & Heath, 2007). Much of extant crisis and risk communication research associated with technological disasters remains of primary benefit to institutional stakeholders seeking to preserve organizational reputation and profitability post-crisis, or to those seeking to manage risk by learning from past mistakes (Coombs, 2007; Eisenman, Cordasco, Asch, Golden, & Glik, 2007; Falkheimer & Heide, 2006; Hale, Dulek, & Hale, 2005; Reynolds & Seeger, 2005; Seeger, 2002; Tyler, 2005; Waymer & Heath, 2007). While ample public-centric research examines the consequences of natural disasters (e.g. Katrina), the majority of research involving disasters of a technological nature exists for the express benefit of corporate and/or government interests (Tyler, 2005). While an institution-centric perspective remains important to the retrospective examination and proactive prevention of large-scale technological disasters, the value of this research to powerful corporations can unintentionally overshadow examination of how such disasters affect individuals and communities.

This exploratory study furthers an understanding of the Japanese public's cognitive, affective, and behavioral responses to the potential health threat posed by the Fukushima nuclear catastrophe. Findings obtained through analysis of narrative accounts of individuals' experiences and perspectives extend a sense of how this ongoing technological disaster impacts the physical, spiritual, and emotional wellbeing of individuals, and contribute to an understanding of the recursive influence between interpersonal communication and individuals' experiences and perspectives. Results of

this study should benefit members of the academic community involved in an effort to support those most affected by this disaster.

Because the extended parallel process model (EPPM) consists of concepts associated with cognitive and emotional responses to disaster, including assessment of threat and efficacy, literature pertaining to this theory is reviewed in the following section. Second, because internet based technology filled a crucial communication niche following the onset of this disaster, a review of literature pertaining to online information seeking and the Japanese public's reliance on alternative media establishes the benefit of using textual narrative content as a form of data in this research. Next, information on Japan's historical experience with nuclear energy and the current conditions at the Fukushima Daiichi I plant serves to further contextualize this study. Finally, to support interpretation of data, theoretical and anthropological literature pertaining to Japanese cultural norms is reviewed.

Extended Parallel Process Model (EPPM)

The perceptual-cognitive model of self-regulation (Leventhal, Leventhal, & Contrada, 1998; Witte, 1992) reflects three assumptions concerning the human response to health threats: (a) people are problem solvers, (b) problem solving occurs in context, and (c) perception of threat positively correlates with an individual's motivation to engage in health protecting or health enhancing behaviors. On this basis, it becomes reasonable to assume that the Japanese public's response to the Fukushima disaster exists in relation to perceptions of the health threat posed. Because the extended parallel process model (EPPM) involves concepts associated with cognitive and emotional responses to disaster, including assessment of threat and efficacy of responses intended to reduce the

likelihood or severity of threat, literature associated with this theory becomes valuable in understanding how individuals respond cognitively, affectively, and behaviorally to the health threat posed by the Fukushima nuclear disaster.

Synthesizing a number of earlier fear appeal models, the EPPM remains particularly well-known within the public health sphere, employed most often in guiding development of persuasive messages intended to influence health-related attitudes and behaviors. This model has been applied in a range of research involving public message production within the context of crisis and risk communication, and was recently used to extend vested interest theory for the purpose of improving disaster preparedness messages (Miller, Adame, & Moore, 2013). For the sake of the present study, the understanding of threat and efficacy extended by the EPPM remains of primary interest.

According to this model, responses to threat become determined by appraisal of threat severity and susceptibility, and evaluation of self- and response-efficacy (Maloney, Lapinski, & Witte, 2011; Popova, 2012; Witte & Allen, 2000). In the face of potential danger, an individual first appraises the threat (Witte & Allen, 2000) based on information from one or more sources including official warning messages, direct observation, interpersonal communication, and additional information seeking (Mikami & Ikeda, 1985). If a person concludes that they are not vulnerable to the threat, or that the consequences of the threat remain minor (low perceived threat), they will likely ignore the threat and/or warnings, but in the face of high perceived threat (both in terms of vulnerability and magnitude of the outcome), individuals become afraid, and this fear motivates action.

Motivated to act in the face of high perceived threat, individuals shift attention to evaluation of self- and response-efficacy (Witte & Allen, 2000). If an individual feels capable of taking effective action to avoid the consequences (high self-efficacy), and the action effectively reduces or eliminates the danger posed (high response-efficacy), they become motivated to respond by acting to control the danger (Bandura, 2004; Witte & Allen, 2000). Those possessing a sense of mastery accrued in lived experiences possess greater resilience, while those with low self-efficacy risk becoming overwhelmed and fearful in the face of threatening circumstances (Bandura, 2004; Bandura & Cervone, 1983; Muzyka, 2012). According to Witte and Allen (2000), in the face of low perceived efficacy (due to low response- and/or low self-efficacy), individuals may attempt to control fear rather than danger by engaging in denial (denying threat susceptibility and/or severity), defensive avoidance (an effort to not think about threat), or reactance (justifying decision to ignore threat by challenging the nature of the threat and/or the ulterior motives of those issuing information). While attempts to control fear rather than danger may initially appear maladaptive, in situations where individuals lack the means to control danger, control of fear represents an entirely reasonable and adaptive response to high perceived threat (Maloney et al., 2011).

Fear represents only one form of emotional arousal, and individuals experience a range of emotions in the face of high perceived threat (Witte, 2012), including shock, anger, sadness, depression (Popova, 2012; Witte & Allen, 2000), anxiety (So, 2013; Witte & Allen, 2000), and compassion (Popova, 2012). Similarly, when threat assessment results in cognitive uncertainty, people often become motivated to engage in information-seeking behavior (Goodall & Reed, 2013; Rimal, 2001; So, 2013).

Online Information Seeking and Alternative Media

The ability to obtain health information from online sources fills knowledge gaps, enhances self-efficacy, facilitates decision making, and positively influences the adoption of health promoting behaviors (Morahan-Martin, 2004). As people increasingly turned to online sources for health information and the need for technological expertise lessened with development of user-friendly interfaces, dissemination of information by “citizen journalists” increased (Brashers, Goldsmith, & Hsieh, 2002), and internet access enabled increased sharing of health related content. Over the last decade, widespread access to the internet enabled an historically unprecedented level of global intercommunication and information exchange among individuals, perhaps to the chagrin of those once wielding the power to moderate or filter information flow.¹ According to Fujigaki and Tsukahara (2011), people in Japan used the internet to seek information following the explosion of multiple reactors at Fukushima Daiichi when official risk communication issued by the government offered few details to inform decision-making. The population’s high media literacy led the Japanese to seek online information from independent alternative media sources, and filling this niche, individuals responded to this need by creating websites for the explicitly stated purpose of letting others know what was really happening in Japan.

Defining Alternative Media

Online exchange of information through alternative media channels (blogs, social networking platforms, and non-mainstream news websites) contributed to the Japanese public’s assessment of and response to the threat posed by the Fukushima disaster.

Alternative media is not a new phenomenon, having existed in print form – particularly during periods of social upheaval – as early as the 17th century (Harcup, 2003). Rather,

economic barriers long associated with production and distribution of print and video content to a large geographic audience became largely alleviated with the advent of electronic technologies which enabled less well-funded alternative media to expand in prominence and reach (Hamilton & Atton, 2001; Harcup, 2003). Broadly defined, the term “alternative media” refers to a heterogeneous range of media and journalistic practices identified by how alternative media structure, function, and processes differ from that of traditional or mainstream media (Hamilton & Atton, 2001; Harcup, 2003/2005; Kelly, 2011; Sandoval & Fuchs, 2010). Because alternative media content serves as the source of data for this study (see Chapter Two), the following sections detail the similarities and differences between traditional and alternative media which collectively distinguish alternative media content and journalistic practices from those of traditional media.

The behemoth – traditional news media. The political independence of traditional media – colloquially referred to as the fourth estate - has been credited with facilitating democracy in the US and elsewhere (Hamilton & Atton, 2001; Harcup, 2003; Kelly, 2011). Yet even before mass media achieved commercial success due to growth of advertising in the 1850’s, the elitist influence on the interpretation of events of political import in media became acknowledged (Hamilton & Atton, 2001). Informed by the mass society thesis, media’s power to encourage public action during the period of the American Revolution and ensuing nationalist consolidation was understood as crucial in directing and prodding the masses into action, but such action remained subordinated to the agenda of the elite whose opinions informed media interpretations of events. According to Hamilton and Atton (2001), the historical struggle for press freedom was

not synonymous with a mandate for economic or popular freedom; rather, grand narratives featured in media legitimized the notion of great leaders as the engines of progress, downplayed economic and systemic inequalities, naturalized class divisions, and ignored the existence of working class political struggles or scholarship (p. 119-120). By uncritically emphasizing the primacy of consensus, even media coverage with the explicit goal of giving a voice to the marginalized failed to challenge the commercial media paradigm by downplaying the conflicts and coercive structures against which people struggled (Hamilton & Atton, 2001).

Today, concentrated corporate ownership of mass media reflects a dominant hegemonic discourse associated with fiscal dependence on the business model of news production, circulation, and consumption (Kelly, 2011; Hall, 1999; Harcup, 2003). By employing a dichotomous rhetorical framework (covering a story from just two diametrically opposed perspectives), this superficial “balance” in traditional media obscures diversity of opinion by failing to explore other perspectives or possible commonalities, reinforcing a reductive conceptualization of democracy as the tallying of the views of two groups in direct contention (Kelly, 2011). Consistent with a top-down, vertical structure, stories in traditional media privilege the voices of those in power – the politicians, corporations, and police – who become the primary definers of an event, and whose interpretation of the story creates the frame and limits discussion of others perspectives of the event (Hall, Critcher, Jefferson, Clarke, & Roberts, 1978; Harcup, 2003, Kelly, 2011). Decisions on what stories, texts, and images to present, or not present, produces a normative influence, where primary definers decide (a) how to frame problems, (b) which views to legitimize as “expert,” and (c) what potential solutions are

examined (Kelly, 2011). As a result of financial dependence of news corporations, traditional media have responded to the recent financial crisis by deemphasizing investigative journalism, resulting in an increased focus on immediate news pegs rather than sustained coverage of public policy issues.

Filling the vacuum - alternative media. Alternative media cannot be understood or analyzed separately from that of traditional media, as alternative media exists, in part, to compensate for the shortcomings of traditional news sources and coverage, and to challenge the dominant hegemonic discourse of traditional media (Hamilton & Atton, 2001; Harcup, 2003/2005; Kelly, 2011, Sandoval & Fuchs, 2010). By covering stories in far greater depth instead of cuing off news pegs, and by contesting the codes, identities, and institutionalized social relationships depicted in the public policy pedagogy of corporate traditional media, alternative media seeks to empower an otherwise marginalized public (Harcup, 2003; Kelly, 2011).

By encouraging citizens to engage critically with the output of traditional media, keeping otherwise extinguished issues alive through vigorous debate, and challenging a singular view of normality, alternative media requires critical content and critical producers (Habermas, 1992; Harcup, 2005; Sandoval & Fuchs, 2010). By providing critical content, alternative media explicitly examines issues of social inequality, questions what society has failed to become, and advances the interests of social transformation and affecting positive change (Sandoval & Fuchs, 2010). Rather than prominently featuring the perspectives of primary definers, alternative media producers frequently include extended quotes from non-expert eyewitnesses, and extend news coverage far beyond the bounds of the dominant ideological frame (Harcup, 2003). In

addition to relying on different sources, a more horizontal relationship exists between alternative media producers and sources, where the lines between producer and source often become blurred (Finn & Gil de Zuniga, 2011; Harcup, 2003).

The alternative media audience remains small compared to that of traditional media, and because of reliance on noncommercial financing (e.g. donations) in order to maintain independence, gaining visibility is more challenging for alternative media (Harcup, 2003; Sandoval & Fuchs, 2010). As a result of limited resources, alternative media cannot focus on the entire range of issues covered by the traditional media, but instead typically focuses on a smaller set of issues associated with the interests of a specific audience.

Assessing Credibility of Traditional and Alternative Media

While frequently conflated, a lack of ideological bias in media is not synonymous with the concept of credibility. As Winston Churchill remains known for saying, “History is written by the victors.” This oft-repeated idiom refers to the prevalence and inevitability of bias in historical accounting of events resulting from determination of which events become deemed most significant to recounting of larger national narratives. Whether intentional or unintentional, implicit or explicit, bias in media can be identified by virtue of which stories are covered, which stories are not covered, and by how a story or event is framed (Hamilton & Atton, 2001; Harcup, 2003/2005; Kelly, 2011, Sandoval & Fuchs, 2010). For traditional media producers, implicit bias becomes *de rigueur*, as acknowledging otherwise would contradict the perception of balance and objectivity they seek to instill in audiences. In this sense, alternative media producers exist in a more enviable position; sans expectations of “balance,” producers frequently communicate

their *raison d'être* and associated bias directly and explicitly with audiences, and encourage the audience to critically analyze traditional and alternative media content without fear that illuminating inevitable bias will negatively impact their credibility. Ultimately, the perception of media credibility depends more on the public's perceptions of the veracity of information presented as fact, the reputation of the source, and on how closely media content resonates with the public's preexisting ideological predispositions, rather than on analysis of the presence or absence of bias.

While alternative media content often serves to critique the normative discourse of traditional media coverage, the limited reach of alternative media constrains transformative potential (Sandoval & Fuchs, 2010), whereas traditional media holds the power to challenge the credibility of alternative media through disciplinary rhetoric (Jordan, 2007). According to Jordan, by defining credibility as consonant only with the practices they employ, traditional media can challenge the journalistic value or legitimacy of alternative media sources, question the credibility or professionalism of alternative media producers, or rhetorically instill skepticism or suspicion of alternative media. As a result, "the burden of evidence rests on the alternative news site's ability to relay information convincingly if not definitively," (p. 293), a burden which ironically compels producers of alternative media to exercise more diligence in documenting and supporting claims to support the veracity of the information they provide.

Research involving the credibility of online sources often relies on the concept of source credibility deriving from cognitive models of criteria associated with positive trust (Finn & Gil de Zuniga, 2011), but the concept of source credibility fails to account for a networked understanding of credibility akin to the trust established in traditional

interpersonal encounters. While online content becomes perceived as more credible, for example, if authored by males, or associated with well known media brands or logos, such markers fail to account for the heuristics used in assessing the credibility of online material when participation is mutually supportive and meaningful (Finn & Gil de Zuniga). These authors suggest that because of the collaborative knowledge building that occurs between producers, sources, and consumers of alternative media, and the online and offline communication these parties have with others, the network of trust and credibility that forms with respect to online content cannot be accounted for or fully understood using the present models of assessing online credibility.

Coverage of the Fukushima Disaster in Japanese Media

As suggested by this review, two constants – reach and dependence on corporate financing – serve as the primary means of distinguishing traditional media from alternative media. Alternative media possess: (a) a smaller reach than that of traditional media (measured by size of audience), and (b) a lack of dependence on corporate financing (as a result of low overhead costs for staffing, production, and distribution of content). In Japan, as elsewhere, traditional media coverage of the Fukushima disaster becomes unavoidably influenced by corporate and governmental interests. Informed by crisis communication research, traditional media content often serves to reduce fear and promote a sense of normalcy following technological disasters, a common strategy for minimizing negative economic consequences (Omer & Alon, 1994). Alternative media in Japan, less constrained by fiscal dependence, was – at least until recently – a valuable resource for those seeking information on the Fukushima disaster.

While the Japanese public benefited from access to media coverage reflecting a range of perspectives on the Fukushima disaster between 2011-2013, a controversial state secrets bill passed December 6th, 2013 poses a significant threat to the fourth estate function served by traditional and alternative media in Japan (Mie, 2013a; Reynolds & Hirokawa, 2013). Under the provisions of this bill, multiple government agencies have the power to define what constitutes a state secret, and those who leak information concerning defense, diplomacy, terrorism, and safety threats become subject to jail terms of up to ten years (Reynolds & Hirokawa, 2013). According to *The Japan Times*, passage of this bill has led to public suspicion that the government will hide or dispose of information, or imprison those leaking or even seeking such information (Mie, 2013a). Because safety threats are specifically named as one category of state secrets, this bill creates a chilling effect on both traditional and alternative media coverage of the Fukushima disaster within Japan. While access to information from international media sources remains exempt from penalty under this Japanese secrecy law, few international media sources produced outside of Japan publish content concerning this disaster in the Japanese language.

A Nuclear Legacy

To further contextualize this research, this section begins with a summary of Japan's historical experience with nuclear energy, followed by information on current conditions at the Fukushima Daiichi I plant. Information on current plant conditions presented in this section represents a summary of reports where consensus exists between traditional and alternative media accounts.

Japan's Historical Experience with Nuclear Energy

Initiated in 1940, Japan's first nuclear weapons program, F-Go, operated for five years before the US dropped two atomic weapons on Hiroshima and Nagasaki (Trento, 2012). Scientists working for Dr. Nishina in Kyoto produced a cyclotron in 1943, but lacking a sufficient source of raw uranium (U-238), Japan sought Germany's assistance, and Hitler agreed to provide Japan with 1,200 pounds of U-238. As fighting in Japan intensified, Nishina's team moved to Hungman, a small town in present-day N. Korea. After a U.S. warship intercepted the German submarine transporting the U-238 in May 1945, the uranium was sent to Oak Ridge, TN for use in the Manhattan Project. In Oak Ridge, enriched uranium (U-235) was extracted from U-238 for use in "Little Boy," the bomb dropped August 6, 1945 on Hiroshima (Nave, 2013; Trento, 2012). Weapons-grade plutonium (Pu-239) made from U-238 processed in the Savannah River and Hanford nuclear plants was used in "Fat Man," the bomb dropped over Nagasaki on August 9, 1945. According to several historical accounts, Dr. Nishina's team successfully tested a very small nuclear bomb only three days later, on August 12th, 1945, in what has been described as a largely symbolic gesture (Trento, 2012). By the end of 1945, at least 225,000 people had died in Hiroshima and Nagasaki (Atomic Archive, 2013; ICAN, n.d.; Yamazaki, 2007), and survivors of the initial blast suffered from a higher lifetime incidence of leukemia and thyroid, breast, and lung cancer (ICAN, n.d.).

Despite the population's aversion to atomic energy following the bombing of Hiroshima and Nagasaki, the U.S. encouraged Japan to enter the nuclear power business in the 1950s as part of Eisenhower's Atoms for Peace Program (Trento, 2012). The Japanese government successfully promoted nuclear power for production of electricity

and development of a national space program, and after the Tokai nuclear reactor produced by Magnox came online in the early 1960's, more than 50 General Electric and Westinghouse reactors were constructed throughout Japan with little regard for the nation's seismic history. Japan now possesses significant quantities of Pu-239 and the Japanese constitution imposes strict limits on the use of atomic energy ("Fukushima: Two Years After," 2013), although Prime Minister Abe recently proposed seeking changes to various agreements in the interests of lifting the constitutional ban on nuclear weapon production.

Nuclear accidents and near-misses. Several nuclear accidents occurred in Japan prior to March 2011 (Trento, 2012). Two significant accidents occurred at nuclear power plants in the 1990s, including a fire and leak of three tons of radioactive sodium at the Monju fast-breeder reactor in 1995, and a radioactive leak at the Tokai reprocessing plant in 1997. A cover-up became suspected after prefecture officials were prevented from investigating an accident at the Tsuruga I reactor in Fukui Prefecture during the 1980s. After the 1995 accident at Monju, Fukui Prefecture officials again suspected that plant operators were concealing the truth, and acting on these suspicions, officials entered the plant and secured a videotape proving that the accident was caused by a ruptured pipe in a secondary cooling system. After the Monju operator's attempt to conceal evidence became publicly revealed, one senior executive committed suicide.

Transoceanic transportation of nuclear material generally remains perceived as safer than transporting this material by air (Trento, 2012). Thousands of tons of reactor waste are shipped to Japan for reprocessing each year, and while no significant accidents have resulted, a major disaster off the coast of Chile was narrowly averted in 1995 when

a vessel carrying tons of waste plutonium between France and Japan became battered by 40 foot waves and engaged in a heated standoff with the Chilean Coast Guard before eventually granted permission to seek shelter in a Patagonian bay. To the extent that past experiences presage the future, the Fukushima nuclear disaster in March 2011 was foreshadowed by Japan's historical experiences with nuclear power, with potentially devastating consequences.

Current Conditions at Fukushima Daiichi

Until the summer of 2013, alternative media served as the principle source of information on the ongoing threat posed by the Fukushima nuclear disaster. Beginning in July 2013, reports published by traditional and alternative media reflected an increased consensus of past events and current conditions at the Fukushima Daiichi I plant, and this convergence between media accounts makes it possible to determine what the Japanese public now understands concerning this nuclear disaster.

Reactors 1-5 at Fukushima Daiichi are GE Mark 1 boiling water reactors notorious for serious design flaws, including a small containment unable to withstand the pressure resulting from loss of cooling (Mosk, 2011). In 1975, four years after the first reactors came online at Fukushima Daiichi, three top engineers at GE resigned after becoming convinced that these design flaws would eventually result in catastrophe. According to Tepco, Naoto Kan (Prime Minister of Japan in March 2011), and various Japanese and U.S. officials, three full core meltdowns and a breach of primary and secondary containment occurred in reactor nos. 1, 2, and 3 within a few days of the March 2011 earthquake, although official acknowledgement of these meltdowns did not occur until May of 2011 (Kan, 2013; Miroslav, 2011; Nagata & Ito, 2011; "Tepco: Not

all Pumped Water,” 2013; Wald, 2013; Wingfield-Hayes, 2013). According to Tepco, the condition and location of these molten reactor cores remains unknown (Nishikawa, 2014).

“China syndrome,” a term coined for use in a fictional Hollywood movie (Bridges, 1979) to describe a hypothetical worse-case nuclear scenario, entered the public vernacular when the Three Mile Island disaster occurred just days after the movie was released in theatres. While no one expects the Fukushima corium to burrow through the earth and emerge at Japan’s antipode in the Atlantic adjacent to the east coast of Brazil as portrayed in *The China Syndrome*, no alternative technical term exists to so aptly convey the uncertainty experienced by experts in the nuclear industry as a consequence of this disaster.

While steam events at the Daiichi I plant remained visible throughout 2011 and 2012 via Tepco’s live streaming webcams, it was only in July 2013 following Tepco’s discovery of record-high radiation levels in the groundwater near the plant that traditional media joined alternative media in reporting visible radioactive steam emanating from damaged reactors (“Fukushima Nuclear Plant,” 2013; Okuyama & Rada, 2013).² Isotopes with a short half-life, such as iodine-131 (8 day half-life), xenon-133 (five day half-life), and xenon-135 (nine hour half-life) detected in air samples in Japan and elsewhere in June of 2013 confirms that recriticality (spontaneous nuclear fission) continues to occur as molten corium come into contact with groundwater (Kiger, 2013; “Nuclear Expert: Xenon,” 2013). In late July 2013, Tepco officially acknowledged what radiation experts worldwide long suspected - that highly radioactive water has leaked unabated into the Pacific daily since March 2011 (Estes, 2013; “Fukushima Nuclear

Plant,” 2013; Inajima & Adelman, 2013; “Japan: Radioactive Water,” 2013; “Suga,” 2013; Tabuchi, 2013; Willacy, 2013).

One of Tepco’s biggest challenges involves the quantity of water flowing through the crippled plant each day. The Fukushima Daiichi I plant sits above the largest underground freshwater aquifer in Japan, and a complex system of underground tunnels and wells built to redirect 400-600 metric tons of water a day from area rivers and streams became irreparably damaged by the 2011 earthquake (Kiger, 2013). In addition, Tepco must pour 400 metric tons of water through the damaged reactors each day to control temperatures at the plant (Ito & Maemura, 2013). As this water travels through the buildings, basements, and underground tunnels, it becomes highly radioactive before flowing, unfiltered, into the Pacific Ocean and the Ibaraki Aquifer (Kiger, 2013). The Daiichi I structures and radioactive water storage tanks now remain swamped with radioactive water (Ito & Maemura, 2013). Tepco has proposed building an ice barrier to protect the sea from further radioactive contamination, but experts warn such a barrier would only exacerbate the already dangerous subsidence occurring at the water-saturated site, increasing the likelihood that the reactor buildings, still housing thousands of spent fuel rods, would collapse (McNeill, 2013; Sukhoi, 2013; Thompson, 2013; Wingfield-Hayes, 2013).

As a result of explosions, pool fires, and subsidence, reactor building no. 4 has become structurally unstable, and the condition of this building remains a matter of international concern because in GE Mark 1 reactors, spent fuel pools are located on the 5th floor – a design that was phased out in subsequent models for obvious safety reasons (Mosk, 2011). In addition to a new reactor core comprised of 200 enriched uranium

assembly bundles,³ over 1,300 spent fuel assemblies containing plutonium, cesium, and other fission byproducts remain in the no. 4 cooling pool, and if this building were to topple, experts estimate that over 14,000 times the amount of cesium-137 released in Hiroshima would become dispersed, posing a significant threat to residents as far away as Tokyo (Iwata & Dvorak, 2013; Sheldrick & Slodkowski, 2013). Tepco began removing the rods in building no. 4 in November of 2013, but because many rods and assemblies remain broken or deformed, this process must be performed manually over a period of one to two years, and the potential for inadvertent criticality (an atomic reaction) if rods or bundles come into close proximity increases the risk associated with this procedure.

Scope of the disaster. Tepco's historic lack of transparency in reporting data (Hayashi, 2013; Mie, 2013b) makes it difficult for experts to accurately quantify the amount of radiation released as a consequence of this disaster. While the accuracy of Tepco's measurements remains questionable at best, recent media reports based on the limited data obtained from Tepco serve as a preliminary indicator of the scope of this disaster, and measurements of tritium, cesium, and strontium can be extrapolated to approximate releases of another 1,600+ radioactive isotopes associated with this nuclear catastrophe. Not taking more significant initial releases in March and April of 2011 into account, approximately 40 trillion becquerels of radioactive tritium has been released into the Pacific as of mid-2013 ("Fukushima Plant," 2013). Between March 21 and July 2011 alone, excluding larger releases in the first week of the disaster, 27 quadrillion⁴ becquerels of cesium-137 flowed into the sea ("27 Quadrillion Becquerels of Cesium-137," 2011).

When measuring cesium levels in groundwater at the plant on the 5th and 8th of July 2013, Tepco discovered that cesium levels had risen 110-fold in just three days (Hamada, Tsukimori, Cho, Chung, Martinez, & Sheldrick, 2013; “Officials Report,” 2013; “Tepco Now Admits,” 2013; “Toxic Groundwater,” 2013). As of July 8th, 2013, the cesium-134 and cesium-137 measured in the groundwater amounted to three times more than the total amount of cesium released in the Chernobyl accident (McNeill, 2013). According to reports published in The Japan Times and Asahi Shimbun on July 26, 2013, Tepco measured 3,000,000,000 becquerels/liter of radioactive isotopes, including 2.35 billion becquerels of cesium, and 750 million becquerels of beta ray emitters such as strontium-90 (Sr-90) in water along an underground cable trench, leading Tepco to speculate that one of the molten cores remained somewhere under no. 2 turbine building (Kimura, 2013b; Mizuno, 2013; “Tepco: Trench,” 2013). With 5,000 metric tons (~five million liters) of water in this trench, Tepco estimates that over 15 quadrillion becquerels of radiation have leaked into groundwater (“Over 15 Quadrillion Becquerels,” 2013).

Tepco first tested for Sr-90, a form of radiation considered more dangerous to health than cesium, in July 2013 in a monitoring well between reactor building no. 2 and the ocean, and at the time, Tepco officials reported strontium levels remained more than 100 times higher than that of cesium, or approximately 450,000 becquerels per liter (Kiger, 2013; “Record-High 10 Million,” 2014; “Tepco Corrects,” 2013). In December 2013, Tepco reported 1.8 million becquerels per liter of Sr-90 and other beta ray sources at this same site (“Record Radiation,” 2013), with strontium accounting for half of all beta particle-emitting isotopes in the water (“Record-High 10 Million,” 2014; “Tepco

Corrects,” 2013). In February 2014 Tepco admitted that July measurements showed that this water actually contained 10 million becquerels of beta particles or 5 million becquerels of Sr-90 per liter.⁵

The use of mixed oxide (MOX) fuel in Reactor No. 3 increases the risk of negative health consequences associated with the disaster. Because plutonium exists only as a byproduct of nuclear fission (Nave, 2013), most nuclear power plants serve a dual purpose: generation of electricity for public use, and production of plutonium for national weapons programs (Trento, 2012). Following an agreement negotiated in the 1960s by President Johnson and Prime Minister Sato, Japan began sending spent fuel rods to Europe for reprocessing in breeder reactors, but after the U.S. Department of Energy concluded in 1978 that breeder reactors remained too costly and dangerous to operate on U.S. soil, they transferred the only breeder reactor in the U.S. to Japan. By 2011, Japan had accumulated over 70 metric tons of weapon-grade plutonium (Pu-239) – more than that amassed by China, India, and Pakistan combined. Retrofitted in 2010, Fukushima Daiichi reactor no. 3 was running on MOX fuel on March 11, 2011 (Bensi, 2011; Karam, 2006; Trento, 2012; “US Gov’t: Plutonium,” 2013”). According to Tepco and the U.S. Nuclear Regulatory Commission, the high concentration of plutonium measured in the soil, groundwater, and sediment throughout Fukushima Prefecture indicates that part of the MOX fuel reactor core became aerosolized and jettisoned into the air when the reactor exploded on March 14, 2011 (Bensi, 2011; Kimura, 2013a; “US Gov’t: Plutonium,” 2013).

Japanese Culture

Because cultural and social norms influence how individuals respond to disasters (Dueck & Byron, 2011), a general understanding of Japanese cultural and social norms and traditions helps contextualize the present study. This section begins with a review of cross-cultural research and anthropological literature associated with social and cultural norms in Japan, and concludes with a review of literature pertaining to the social consequences of exposure to nuclear radiation in Japan.

Social and Cultural Norms

While Japan is often described as an highly homogeneous society, generalizations of national culture – by definition – cannot account for ethnic and cultural diversity within a nation, or for variation associated with age, gender, and social class (Caudill, 1973; Morris-Suzuki, 1995). While most cross-cultural frameworks focus on national culture (Morris-Suzuki, 1995), findings associated with application of these frameworks contribute to an understanding of contemporary Japanese culture.

Introduced in 1980, Hofstede's national cultural framework is a well-known cross-cultural model used in ranking and grouping countries according to five distinct cultural dimensions: individualism, uncertainty avoidance, power distance, masculinity, and long term (temporal) orientation (Hofstede, 2001; Hofstede Centre, 2012; Huntington, 1993; Yamamura, Satoh, & Stedham, 2003). As an influential framework, the conceptualizations associated with these dimensions have become widely understood, and serve as a point of reference for describing cross-cultural constructs in multiple studies. Therefore, findings from empirical research and anthropological literature

associated with Japanese culture presented in this section remain organized according to Hofstede's five dimensions.

Individualism vs. collectivism. The dimension of individualism reflects a national population's level of interdependence (Hofstede Centre, 2012). In highly individualistic cultures, individuals operate independently from others because the centrality of the individual unit prioritizes characteristics such as autonomy and self-sufficiency (Hofstede, 2001; Hofstede Centre, 2012; Lim, Kim, & Kim, 2011; Markus & Kitayama, 1991; Yamamura et al., 2003). In contrast, individuals in highly collectivistic cultures belong to integrated, cohesive groups because the centrality of the group unit prioritizes characteristics such as group loyalty and subordination of individual autonomy to what is in the best interests of one's in-group.

While most Asian countries rank high for collectivism, Japan is alternately described as moderately individualistic (Hofstede, 2001; Yamamura et al., 2003), or moderately collectivistic (Kim, Lim, Dindia, & Burrell, 2010). Although the Japanese prioritize group harmony over individual expression of autonomy, emphasize the importance of group loyalty, and experience shame associated with loss of face, Japan remains less collectivistic than other Asian cultures (Hofstede Centre, 2012; Yamamura et al., 2003). In most collectivistic societies, individuals exist as part of an "inherited" in-group comprised of an extended family system to which they are born, whereas the practice of primogeniture (abolished only in the 1940s) encouraged the formation of small nuclear families in Japan (Caudill, 1973). In the absence of an extended family system, in-group membership in Japan becomes determined by choices made at the

individual level, such as what profession to enter, where to attend school, and where to work (Caudill, 1973; Hofstede Centre, 2012).

Despite the heuristic value of the individualism dimension, numerous challenges associated with use of this construct exist (Kim et al., 2010; Lim et al., 2011; Markus & Kitayama, 1991; Yamamura et al., 2003). As a West-centric framework, application results in an almost universal categorization of Western cultures as individualistic, and Eastern cultures as collectivistic (Lim et al., 2011). In addition to problems associated with attempting to categorize a complex modern society such as Japan as either individualistic or collectivistic, Lim et al. suggest that Moemeka's construct of communalism – rather than collectivism – may more accurately capture the differences between individualistic and non-individualistic societies. In attempting to partly reconcile the seeming paradox of Japan's "essentially Western-style set of urban and industrial institutions ... and Eastern-style communal system of social relations" (Caudill, 1973, p. 360), Kim et al. (2010) have suggested that in Japan, an individual's public and private selves can be interpreted as collectivistic or individualistic, respectively. Because of the challenges associated with Hofstede's individualism-collectivism construct, Markus and Kitayama (1991) and Kim et al. (2010) have advanced alternative constructs for this dimension.

Independent-interdependent self-construal. Markus and Kitayama (1991) suggest that an individual-level construct – self-construal – provides a better means of reflecting a national population's level of interdependence. According to Markus and Kitayama, individuals with an independent self-construal possess an autonomous orientation associated with individuation, self-actualization, and self-expression, while

individuals with an interdependent self-construal possess a social/relational orientation associated with a more fluid sense of self which changes according to the interpersonal relationships one is engaged in. In illustrating how the self-construal construct avoids the challenges associated with the individualism dimension, Markus and Kitayama explain that the Japanese possess an interdependent self-construal where individual autonomy and personal opinions still exist, but become constrained for the sake of fitting in with others. Because the ability to interact harmoniously with others contributes to an individual's self-esteem, the Japanese express other-focused emotions such as sympathy and shame to foster interdependence, and avoid expressing negative ego-focused emotions such as anger because these emotions threaten interdependence and maintenance of harmonious relationships. The importance of other-focused emotions is echoed in Caudill's (1973) description of behavioral norms, as the Japanese tend to act with deference and politeness, attend carefully to nonverbal communication, and share a strong sense of obligation, gratitude, and compassion for others.

Analytic-holistic worldview. Centered on the relationship between culture and perception, this construct extends an important understanding of how people from Eastern and Western cultures differ. In general, Westerners possess an analytic worldview, seeking to understand things by employing a reductive approach to analysis, while Easterners see everything as a whole, and do not attempt to analyze segments of the whole in isolation (Kim et al., 2010). Predicated on the awareness that all life is interconnected, those with a holistic worldview understand that no one part can function or be understood in isolation from the whole, and this distinction extends a meaningful understanding of the origins of cultural norms in the East. For example, from this holistic

perspective, the Japanese tendency to remain other-oriented and adaptable when interacting with others, and communicate in a way that fosters harmony becomes essential because – as an inseparable part of the whole – the positive or negative consequences of interactions impacts everyone, regardless of the role they play in a given interaction.

Uncertainty avoidance. This dimension becomes associated with how a national population responds to uncertainty about the future and the anxiety associated with ambiguous situations (Hofstede Centre, 2012). In countries ranking high for this dimension, uncertainty is perceived as a threat, and individuals tend to avoid taking risks, resist change, and express company loyalty (Yamamura et al., 2003). Japan ranks very high in uncertainty avoidance, and to ensure stability and predictability, the Japanese rely on planning, rules, and codes of conduct to maintain order (Caudill, 1973; Yamamura et al., 2003). It has been suggested that because Japanese exist under constant threat from natural disasters such as earthquakes, tsunamis, and volcanic eruptions, the population becomes accustomed to preparing for the unexpected across contexts, where strict adherence to rituals and precedent reflects this need to maximize predictability (Hofstede Centre, 2012).

Despite attempts to avoid uncertainty, trauma associated with significant disasters can strip individuals of a sense of predictability, security, and trust, and interfere with celebration of rituals, especially when people lose access to traditional or sacred spaces (Dueck & Byron, 2011). For example, during the Obon festival each summer, people in Japan gather at the familial graveyard to honor and give thanks to the spirits of their ancestors (Caudill, 1973; Godoy, 2013). In a ritual which has been observed

uninterrupted for countless generations, family members clean and decorate the graves of ancestors, invite these spirits to visit with the living family members for several days, and then accompany the spirits back to the graveyard (Godoy, 2013). When the family graveyard exists within an evacuation zone, people experience distress over the inability to honor their ancestors, and worse, feel that the ancestors will never know that the family's absence does not signify intentional disrespect (Godoy, 2013, p. 3).

Compounding the emotional burden associated with the inability to maintain this ritual, bodies of tsunami victims that washed up near the Fukushima Daiichi plant became designated as nuclear waste, and relatives could not give them a proper burial.

Power distance. This dimension reflects the degree to which inequality is accepted by a population, and a population's attitude towards this inequality (Hofstede Centre, 2012; Yamamura et al., 2003). A more equitable distribution of power distinguishes countries ranking low in power distance, while inequality appears more prevalent in countries ranking high in power distance (Yamamura et al., 2003). Derived in part by comparison with other – more hierarchical – nations, Japan presents as either moderately egalitarian, or as moderately hierarchical (Caudill, 1973; Hofstede Centre, 2012; Yamamura et al., 2003). The presence of an hierarchical structure in Japan remains wholly compatible with high uncertainty avoidance and the need for predictability because these vertically structured organizations prescriptively “demand strict allegiance and self-sacrifice” (Caudill, 1973, p. 361). At the same time, the consensus-based tradition of decision-making in Japan moderates the otherwise hierarchical (vertical) structure evidenced throughout business, government, and academic life (Caudill, 1973; Dueck & Byron, 2011; Yamamura et al., 2003; Yamashita & Williams, 2002). According

to Kim et al. (2010), the Japanese engage in an intuitive, holistic approach to making decisions involving more indirect and agreement centered strategies. This somewhat egalitarian approach to decision-making through consensus acts to preserve harmony among members within hierarchical organizations.

Consistent with an emphasis on predictability and an hierarchical organizational structure, the amount of formal education a person possesses, combined with the prestige of the academic institution they attend, determines an individual's upward mobility within an organization (Caudill, 1973). Social change in Japan occurs from above, and the public rarely becomes involved in the decision-making process. As a result, technological development continues to outpace social change in Japan because social change remains deliberately controlled by those with the power to regulate the nature and rate of change within Japan.

Masculinity. Based on the presumption that competition, achievement, and success represent masculine characteristics, this dimension reflects the degree to which cultural motivations embody masculine traits (Hofstede Centre, 2012). In highly masculine countries, gender roles remain more clearly differentiated, material success becomes a priority, and job-related stress is high (Yamamura et al., 2003). Japan ranked significantly higher in masculinity than any country in Hofstede's original study, although research conducted in 2002 (Hofstede, 2001; Yamamura et al., 2003) indicates that Japan's masculinity scores declined between 1980 and 2002. Japan's high masculinity ranking can best be seen within organizational culture. While harmony within organizations in Japan becomes supported by consensus driven decision-making practices, cooperation and communication between parallel organizations remains limited

because of fierce competition between organizations (Caudill, 1973; Morris-Suzuki, 1995). As a result of this competitive atmosphere, individuals rarely establish close ties with counterparts at other organizations.

Long term orientation. This dimension measures a population's temporal perspective (Caudill, 1973; Hofstede Centre, 2012). Like other Asian nations, Japan shares a long-term (future oriented) perspective. Individuals in future oriented societies tend to share a sense of fatalism associated with an awareness of the ephemeral nature of things – the realization that a human life span represents just a brief moment in time. As a result of this orientation, the Japanese tend to carefully weigh options before acting, and base decisions on the potential long-term benefits instead of being consumed by the need for short-term gains. This future oriented perspective proves especially useful in Japan because planning for unknown future contingencies arises in conjunction with Japan's high uncertainty avoidance

Due to a confluence of factors enumerated in this section – particularly the importance of predictability, harmony, consensus, loyalty and self-sacrifice, and a long-term temporal orientation – a paternalistic relationship exists between Japanese individuals and the organizations to which they belong (Caudill, 1973; Morris-Suzuki, 1995). Caudill (1973) refers to this paternalistic relationship in the workplace as “both the genius and the curse of Japanese life” (p. 361), because when things work well, an employee can achieve a great sense of achievement, but if an employee becomes rejected by his/her employer or colleagues, they will have no place to turn. This paternalistic dynamic extends to public dependence on the benevolence of Japan's leaders, and as a result, the public rarely questions whether the government's actions reflect the best

interests of the population. While this paternalistic relationship can best be understood at a societal level, a paternalistic relationship can only exist with the implicit consent of individuals within a population (Morris-Suzuki, 1995).

Social Consequences of Exposure to Radiation

Following the bombing of Hiroshima and Nagasaki, a new term was added to the Japanese lexicon – hibakusha – to describe those exposed to radiation (Aoki, 2013; “Bishop of Sendai,” 2012; “City Apologizes,” 2011; Yokota, 2013). Roughly translated, hibakusha means “explosion-affected people,” a term most commonly associated with survivors of nuclear bomb blasts in Hiroshima and Nagasaki (Aoki, 2013; Yokota, 2013). Because hibakusha, when written in kanji, can be translated as “survivor of exposure to nuclear radiation,” hibakusha is also used in reference to laborers exposed to “death ash” in nuclear power plants, workers in uranium mines, and to “downwinders” - those exposed to radiation from the manufacture and testing of nuclear weapons (“Bishop of Sendai,” 2012; Yokota, 2013). The meltdowns at Fukushima Daiichi have created a new generation of hibakusha, and people from the Tohoku region now face a lifetime of discrimination (Aoki, 2013; “Bishop of Sendai,” 2012; “City Apologizes,” 2011; Yokota, 2013).

Following the bombing of Hiroshima and Nagasaki, the incidence of birth defects increased in the population exposed to nuclear radiation (ICAN, n.d.). To lessen the possibility of having a child with cognitive or physical defects, people in Japan became unwilling to marry hibakusha (Aoki, 2013), and even the grandchildren of hibakusha remain subject to discrimination. The potential for genetic damage associated with nuclear radiation has been described as a factor contributing to Tepco’s present inability

to fill open positions, and for the widely-criticized use of indigent and disabled “disposable workers” at the Fukushima plant (“TV: Mentally disabled,” 2013).

Lacking a scientific understanding of radiation following WWII, many Japanese shunned hibakusha motivated by fear of contamination, and this discrimination again became evidenced in 2011 following the evacuation of people from Fukushima prefecture (Aoki, 2013; “Bishop of Sendai,” 2012; “City Apologizes,” 2011). As evacuees arrived in Tsukuba City, Ibaraki Prefecture, people seeking permission to permanently move to Tsukuba City were required to undergo a thorough examination proving they were free from internal and external radioactive contamination (“City Apologizes,” 2011). In an April 21, 2011 apology, a Tsukuba City official acknowledged that this local policy was designed to alleviate residents’ concern that people from Fukushima Prefecture would infect others with radiation. Schools in several prefectures would not accept children evacuated from Fukushima (“Bishop of Sendai,” 2012), and in Minamisoma, a city less than 30 km from the Daiichi plant, a cram school now hosts a regular workshop led by a medical doctor designed to help area children and adults counter arguments of those who discriminate against them (Aoki, 2013). In addition to the health threat posed by the Fukushima disaster, the potential for discrimination represents a threat to the wellbeing of those exposed to radiation, as the label of hibakusha may contribute to a sense of isolation or shame associated with an interdependent self-construal (Markus & Kitayama, 1991), or a sense of fatalism associated with Japan’s future orientation (Hofstede Centre, 2012).

Research Questions

Guided by the purpose of this study and as a consequence of the preceding review of extant literature, the following research questions were developed to help direct and focus this research:

- RQ1: What thoughts and feelings do the Japanese people express concerning this disaster and associated consequences? How has this disaster affected the physical, emotional, and spiritual wellbeing of Japanese individuals, families, and communities?
- RQ2: What potential health threats are of express concern to the Japanese public? How significant a threat is perceived, based on expressed evaluations of threat severity, imminence, and likelihood?
- RQ3: What behavioral responses do individuals describe having considered or enacted as a protective measure in response to perceived health threats?
- How has information seeking (either through online or interpersonal communication) influenced decisions on how to respond?
 - How has evaluation of self- and response-efficacy influenced decisions on which behavioral response(s) to enact or reject?
 - How has culture influenced decisions on how to respond?
 - What others factors were taken into account when deciding how to respond?
- RQ4: When reflecting on the outcome(s) of enacted protective responses, how would individuals evaluate the overall efficacy of these response(s)? Under what circumstances would individuals consider engaging in additional protective measures, and which responses might they consider?

Chapter Two

Methods

To gain an understanding of the experiences and perspectives of the Japanese public and explore how individuals have responded to and been impacted by the Fukushima disaster, a narrative content analysis was conducted. As the name suggests, narrative content analysis is a hybrid of narrative analysis and content analysis. Three factors contributed to identification of a narrative content analysis for use in this research. First, narrative analysis remains well suited for research involving responses to crisis. As Heath (2006) has stated, “crisis response *is* narrative” (p. 247), because best practices in crisis communication are developed as a result of listening to crisis narratives. Second, narrative analysis is well-suited to the study of social processes and complex phenomena consistent with the social constructionist perspective of meaning production epistemologically grounding this study, where meaning is understood as co-created in communication among individuals, with culture serving as the context in which meaning becomes interpreted (Chase, 2011; Ellingson, 2009). Third, because narrative analysis lies at the intersection of hermeneutics and phenomenology, extending analysis of written material to a range of textual forms to advance understanding of lived experiences and perspectives through the inductive discovery of recurring patterns or themes in data (Ellingson, 2009; Patton, 2002), narrative analysis remains methodologically similar to that of an inductive content analysis.

Online Content as a Source of Data

Website content is recognized as a valuable source of data for qualitative research of phenomena (Krippendorff, 2004). Just as social scientists rely on archival documents

such as letters, autobiographies, and diaries as a rich source of data for thematic analysis (Riessman, 2008), websites represent a contemporary archival data source. When conducting qualitative research, collecting data that allows for within- and across-case analysis remains ideal, especially when using an inductive approach (Patton, 2002).

Multiple criteria guided collection of narrative-rich online content as data for this research. Initially, two primary criteria were applied to identify publicly accessible alternative media website(s) as a source of data. First, websites focusing on the topic of the Fukushima disaster were identified, and second, websites without English content were eliminated to avoid the need for extensive translation of content.

Next, because narrative data analyzed in this study was intended to serve as a proxy for the views and experiences of the Japanese public, three secondary criteria were applied to further narrow potential sources of data to: (a) websites with content reflecting the perspectives of individual citizens, (b) websites produced or managed by citizen(s) of Japan, as an indicator of the cultural perspective likely to be reflected in content, and (c) websites with a sufficient amount, depth, and breadth of content to support an in-depth qualitative analysis. As an outcome of applying these criteria, one alternative media website – Fukushima Diary – became identified for use as a source of data in this study.

Assessing the credibility of Fukushima Diary. Consistent with the definition of alternative media gleaned from a review of literature, Fukushima Diary provides very detailed coverage of a narrow range of issues, serves to critique the normative discourse of traditional media coverage, appeals to a relatively small audience, and is financed solely through readers' voluntary donations. In the sections below, source credibility and a networked understanding of credibility are addressed.

Source credibility. Having personally relied on information obtained through online social networking applications following the major earthquake on March 11, 2011, Iori Mochizuki recognized how important the ability to electronically exchange current information was, particularly as the disaster continued to unfold in the days following the earthquake and tsunami. Iori Mochizuki worked as a civil engineer in Yokohama, 250 km from Fukushima, and while he did not specialize in nuclear engineering, his educational background provided him with a better than average understanding of technical issues associated with the nuclear aspects of this crisis. As fate would have it, he had just recently decided to learn English, a skill subsequently proving essential to a role as an alternative media producer.

Initially, Iori Mochizuki exchanged information with friends on an individual, one-on-one basis. In July 2011 he created the Fukushima Diary website as a central repository of up-to-date information for friends and strangers alike, and this website quickly attracted an international audience. In December 2011, after experiencing chronic health symptoms similar to those associated with mild radiation poisoning, Iori Mochizuki left Japan, staying as a guest at the homes of readers he had not previously met face-to-face, until he became able to establish a permanent place of residence. Now 30 years old, Iori Mochizuki continues to serve as the producer and senior editor of Fukushima Diary, an alternative news media source which publishes online articles for English, French, and Japanese audiences.

A networked understanding of credibility. In a recent documentary, *On Fukushima Beach 4: Pandora's Poison*, Iori Mochizuki is recognized as one of four individuals thrust through self-conscription into the role of filling the information gap left

by lack of traditional media coverage on this disaster (Ebisu, 2014). I initially became aware of the Fukushima Diary website in 2011 in the process of reading articles and watching videos on the Fukushima disaster, where experts on this subject, including Helen Caldicott (a medical doctor specializing in genetic disease in children, and a founding member of Physicians for Social Responsibility), Arnie Gunderson (a nuclear engineer now affiliated with Fairewinds Energy Education), and Leuren Moret (an independent scientist formerly with Berkeley's Lawrence Livermore Nuclear Laboratory) often referred to Fukushima Diary as a quality source of information. Having since devoted approximately 3,000 hours to conducting research on the Fukushima disaster, I have found the technical information on Fukushima Diary to be consistently credible. While traditional media coverage of this disaster often remained sporadic at best, and lacking in depth,⁶ much of the content published concerning this disaster in both traditional and alternative media consisted of content recognized as having initially been published on Fukushima Diary's website.

In addition to having inside sources working in the Japanese nuclear industry, including source(s) employed at the Fukushima Daiichi plant, Iori Mochizuki downloads and provides information from Tepco press releases on the Fukushima Diary website. Translating information that Tepco has not provided in English, he also contrasts the quantitative data that Tepco provides in both English and Japanese reports, points out instances where the English version understates what is disclosed in the Japanese version of the same report, and frequently provides a detailed explanation of the ramifications of this data, along with a personal critique of what is contained in these reports. Because source URLs are provided for the articles published on Fukushima Diary, I have also

verified the integrity of this information by going to the website links and reading these source documents, especially when I am interested in digging deeper into a specific issue.

Fukushima Diary also publishes articles of an anecdotal nature, including Iori's personal narratives, as well as narratives shared by others. On Fukushima Diary, the audience will find translations of Twitter posts of Japanese citizens, stories that Japanese individuals send to Fukushima Diary for publication, and translations of stories published on other alternative media websites originally written in Japanese. No objective means of verifying the credibility of such anecdotal narratives exists, but because of the highly personal nature of many of the stories shared, there is no cause to doubt the authenticity of experiences and feelings reflected. These narratives represent a rich source of data for the present study.

Collection of Data

All articles containing content of an anecdotal nature or reflecting the experiences, interpretations, perspectives and opinions of Japanese individuals became collected as data for this study. The only articles not collected as data for this study were those containing content of a technical nature without associated analysis or interpretation, because such articles were focused on the disaster as a phenomenon rather than on the perspectives or experiences of individuals. Content published from the time of Fukushima Diary's inception in 2011 through December of 2013 was collected, providing a sufficient amount of data to support a temporal analysis.

Given the ephemeral nature of online material (web-based content can be lost in a second if a server crashes), content from Fukushima Diary was copied and pasted into a Word document and printed twice, once in late August of 2013, and again in late

December 2013. To facilitate coding, no more than one article was printed on a single sheet of paper. Photos and graphs were not printed unless they were of potential analytic importance. Long articles were printed using multiple sheets of paper, and if a multi-page article ended halfway down on a sheet of paper, the next article was printed beginning at the top of a new sheet. As a result, some pages were partly filled with single-spaced text, and other pages were entirely filled. In all, 841 single-spaced pages of data were collected for analysis in this study.

Analysis

Narrative analysis involves interpretation, and “interpretation begins with elucidating meanings” (Patton, 2002, p. 477). Consistent with the crystallization process articulated by Ellingson (2009), Patton (2002) suggests that analysts ask a series of questions to elucidate meaning in narrative data. In conjunction with research questions developed to guide this study, Ellingson’s (2009) analytically robust “wondering” questions were employed to facilitate interpretation of narrative data. Using an iterative process of simultaneous interpretation, open-coding, and across-case analysis (Glaser & Strauss, 1967; Patton, 2002; Riessman, 2008), multiple passes were conducted to identify and refine themes based on recurring patterns and concepts identified in data, until thematic saturation was achieved (Glaser & Strauss, 1967; Patton, 2002). Next, results of the thematic analysis, notes taken throughout this process, and Ellingson’s “wondering” questions were used to synthesize analytic observations and determine how best to subsume themes into theoretically meaningful dimensions (Patton, 2002; Stevens & Galvao, 2007).

Three features distinguish the analytic processes used this narrative content analysis from those used to identify themes when conducting other forms of qualitative research (Riessman, 2008). First, when analyzing data in this study, bounded stories were kept intact, because preserving the contextualized sequence and details of stories facilitates across-case analysis and interpretation. Second, interpretation was data-driven and supported by extant and emergent theory as dictated by data. Third, while analytic attention was not focused specifically on language use, the presence of poignant metaphorical alliterations and the functions these served were explored, and contributed to identification of themes in the present study.

The Three R's – Reflexivity, Representation, and Results

Qualitative research requires adherence to several principles, including the need to engage in reflexivity and exercise mindfulness in the representation of others' experiences (Ellingson, 2009; Hall & Stevens, 1991). In addition to use of first person as warranted, positional and textual reflexivity is addressed in this paper within endnotes, a technique suggested by Ellingson which, in my opinion, provides an ideal means to denote reflexivity separately from analysis and interpretation of findings without unnecessarily distracting the reader.

In the process of recounting experiences, individuals are simultaneously making sense of, evaluating, and ascribing meaning to lived experiences, revealing perspectives in a form accessible to the qualitative researcher (Chase, 2011; Ellingson, 2011; Labov & Waletzky, 1967/2003; Ochs, 2011; Patton, 2002). Because stories remain central to narrative analysis, care was taken to identify exemplar narratives that best illustrated findings (Denzin, 2001; Patton, 2002; Stevens, 1996). Consistent with thick description

(Geertz, 1973), extended exemplars from narrative data served to (a) illustrate findings, (b) allow for assessment of validity of interpretations made, and (c) ensure participants' voices and stories remain prominent, reflecting the spirit of qualitative research and mindful representation of others' experiences (Bell, 2003; Ellingson, 2009; Ellingson, 2011).

Ethical considerations. While institutional review boards rarely require IRB approval for studies involving analysis of publicly accessible website content, IRB approval was sought and obtained before research began, and written permission to use content as data for this research was obtained from the producer of Fukushima Diary.

In identifying the source of data analyzed in this study, it becomes impossible to mask the identity of the producer of this alternative media website, a condition that the producer of Fukushima Diary was made aware of and agreed to. In the few instances where other private individuals could potentially be identified based on details included in a narrative exemplar, care was taken to mask such information in this paper. When narratives included the names of public individuals acting in an official capacity on behalf of Tepco, the Japanese government, NGOs, or national/multinational firms, real names were used when no reasonable expectation of privacy existed. Similarly, the identities of medical, nuclear, media, and academic professionals were not masked when content involved statements or articles these individuals shared publicly.

Chapter Three

Results

Six themes arranged according to two dimensions were identified as a result of analysis. The first dimension, “when the impossible happens,” consists of three themes: (a) a shock to the system, (b) increasing perception of threat, and (c) betrayal and systemic domination. These initial themes center on the Japanese public’s affective and cognitive responses to the threat posed by this nuclear disaster. The second dimension, “we have to save ourselves,” consists of three themes highlighting the Japanese public’s behavioral responses to the health threats posed: (a) the mosquito and the dinosaur, (b) two kinds of people, and (c) a butterfly trying to move a mountain. Collectively, the six themes reveal how the Fukushima disaster impacts the wellbeing of those living in Japan and illuminate the centrality of culture and communication to the Japanese public’s understanding of and response to the nuclear catastrophe.

When the Impossible Happens

The three themes in this dimension, (a) a shock to the system, (b) increasing perception of threat, and (c) betrayal and systemic domination, collectively extend an understanding of the Japanese public’s emotional and cognitive responses to the disaster over time. To maintain a temporal sequence of events, exemplar data used to illustrate themes in this dimension were identified from data published in 2011.

A Shock to the System

This first theme centers on the public’s initial experiences and reactions to the natural and radiological aspects of the Fukushima disaster. Findings associated with this

theme are organized temporally into four sections: (a) a natural disaster, (b) a radiological disaster, (c) a widening schism, and (d) a group mindset.

A natural disaster. Living in a seismically volatile region, the Japanese learned to coexist with the inevitability of earthquakes (Hofstede Centre, 2012), but magnitude 9.0 earthquakes remain exceedingly rare, and nobody anticipates or adequately prepares for the devastation wreaked by such a powerful seismic event. Immediately following the earthquake, widespread chaos ensued, with power outages in densely populated urban areas and strong aftershocks contributing to disorientation and shock even before people became aware of the nuclear danger. By revealing how the public responded in the early days of the disaster, the following exemplars from Iori Mochizuki's detailed narrative accounts of events on March 11 and 12, 2011 serve to introduce recurring patterns central to subsequent themes identified in analysis of data.

When the earthquake occurred at 2:46 p.m. on March 11, 2011, Iori was working alone in his office in Yokohama.

Everything fell off to the floor ... and it went black out. When I went out, I saw women crying on the street; traffic was messed up. I went to the nearest convenience store. ... The shop staff had a radio; then I heard tsunami was coming to Sendai. 15 children and their parents came to the shop. Parents went to pick up their children from a near elementary school. The shop became like a shelter. ... Inside of the shop was complete dark. However, staying there was a right decision ... it became like an information center. Internet still didn't work. No email. No phone line. Even radio station doesn't know what happened, but people brought live information: which area got the power back on, which area is still in black out, JR [Japanese Railroad] stopped, which ATM is available, etc. I learnt information matters.

Even in these first chaotic moments, the value of information and interpersonal communication emerges. Worried for neighbors working nearby, Iori purchases some food and water, and heads back towards his office at 4 p.m.

Power was still dead. Aftershock hit. I couldn't stand still, had to sit down on the ground ... everyone sat on the street too. As sitting on the street, everyone tried to connect to the internet with mobile phone. Now we needed information.

It finally ended. For some reason I took my own photo. I saw what was happening behind me. ... I had my back facing a shopping mall with 5 floors ... hundreds of shopping mall staff were sitting beside the mall building. They looked like scared sparrows. They were still in their uniforms. Inside of the mall must have been completely dark. At the center of the intersection, a cook was arranging the traffic. Everyone did what they can do. I heard people were saying, "Still a lot of people were stuck in the elevators." We didn't know when the power would be back.

As illustrated here, individual responses amidst chaos are not homogeneous.

Some people become virtually immobilized by shock, while others acted by identifying ways to restore order. Approaching his building, Iori encounters the brother of a vegetable shop owner.

I saw him at a loss in front of the building. His mobile radio was broadcasting the live tsunami information. I couldn't understand if it had already come or was coming. It was NHK but it was completely messed up; I hardly caught the word of 15m or 19m. The old man told to nowhere, "It's over. Japan is over." I went into the building.

People living in less developed nations possess an omnipresent sense of vulnerability to the devastating consequences of natural disasters, but those living in more advanced countries often remain insulated from the forces of nature, protected by sophisticated infrastructure and structurally resilient buildings. As a result, the previously inconceivable extent of destruction wrought by this disaster overwhelmed those living in Japan.

Walking up an unlit stairway, Iori encounters two women leaving an office on the second floor of the building.

They were checking Twitter. Twitter was the only source of information. Back in my office, everything was scattered on the floor. My concern was the sun. The dusk must be about 6:30. It was already 4:30. Because of the black out, traffic was

expected to be a complete mess at night. From the story I heard at the convenience store, train was stopped too. I thought I should go home on foot. It might take longer than 2 hours, but I didn't want to walk after the dusk because it would be very dangerous. I decided to go home.

Analysis of narratives revealed the benefit accrued by those possessing experience using various forms of electronic communication technology. While access to social media applications facilitated decision making, people lacking such experience remained disproportionately impacted by the temporary disruption to traditional sources of information.

Iori hears his mother and father struggling up the stairs (he worked as a civil engineer for his father's firm). Holding random objects they had grabbed in panic, including cushions and snacks, his parents appear unaware of the extent of damage and associated transportation difficulties, and plan to wait at the office for the return of employees conducting field work near Sendai.

It was near 5 p.m. and was already starting to get dark and cold. I explained them that I had to hurry and leave there, though it wasn't still ending time of my work. They said we must wait for the coworkers, but as a matter of fact, whether we waited for them or not, nothing changes. My boss/parents were still thinking in the normal range. It was obviously a wrong decision. First, aftershock may have come any time. Second, the power was still dead. Third, telephone, heater, PC, everything was unavailable. Fourth, the place was complete isolated from information. You would never know even if fire happens next door. I dared to break the rule. It was the first time when I thought more of my life and safety than "company." I started thinking as an individual. The game changed. You must break the old rule and mustn't feel scared because you are the leader of your own life. I was already starting to gain some kind of confidence. The rule of the game changed. I was also worried about my turtles. Because it was still cold, I used electric heaters for their cases. If the earthquake moved the heaters out of water, it may cause fire. I had to go home soon as possible. There were other people walking on the street too. Some wore helmets. I walked near those with mobile radio to catch up with information.

The realization that Japan could be thrown into temporary chaos – that the unexpected could in fact occur – led Iori to examine previously unquestioned cultural

norms. The repeated observation that “the rule of the game changed” suggests a dawning awareness that the “old rules” no longer applied in such aberrant circumstances served as the impetus for this idiosyncratic reaction. By deciding to leave work early, Iori consciously violated cultural expectations for the first time in his life by acting in his own best interests rather than remaining loyal to the company and father (Yamamura et al., 2003). Even before becoming aware of the nuclear aspects of this disaster, the events of March 11, 2011 had indelibly altered his perspective.

Arriving at dusk, Iori discovers that power has already been restored to his neighborhood. He finds his apartment in a state of disarray, but the turtles are fine.

The wooden floor was damaged, but the PC was safe. The turtles were hiding in their shells. Heaters were fine as well. I dropped my bag on stool [and] thought. What to do? Turned on the PC and heater. I really appreciate the electricity and had a shower. I didn't forget to stock water in bathtub. I learnt that from the movie titled *The Road*. I didn't have a TV. Had to rely on the internet. The first website I visited was Facebook. Just after the earthquake, most of the websites hosted by Japanese servers went down.

The circumstances described in the above exemplar proved fortuitous in several ways. The seemingly spontaneous decision to store water proved providential when the government subsequently warned people to avoid drinking tap water, and the lack of a television led Iori to rely on online content hosted on servers located outside of Japan for information.

Only Google, Twitter, and Facebook were alive. It was full of “feelings” such as fear, shock, anger, sorrow, but there was not so much useful information. I saw someone posted that NHK and TBS are broadcasting news on Ustream. We usually have to pay for NHK to watch, but they opened their service for emergency. NHK, TBS, they both were reporting tsunami. Black tide, small cars and people running from the sea like ticks running from Hoover. Fire, destroyed towns. I couldn't believe that happened in Japan. Energy got out of my body. I had been tensioned since 14:46 but I became all loose. I was standing in front of the PC. Couldn't even sit down. I cried. I think none of Japanese didn't cry for this scene. My glasses became full of my tears. It was the saddest scene ever.

Innocent people, almost my “family” were killed. Thought about the people killed by the quake and tsunami, and had their family killed too? Why do they have to be killed? Did they do something wrong? Is that punishment? I really wanted to do something for the people. I felt like they were my close family. With my salty glasses, I managed to prepare dinner. With my dinner in my left hand, I opened the website of Nikkei, which is supposed to be the most authentic newspaper, like Wall Street Journal or NYT. Huge headline jumped into my eyes. I hadn’t seen such a warning headline. It read, “Cabinet declared nuclear emergency.”

In attempting to cognitively process events, Iori first laments the dearth of useful information on social media, but quickly becomes susceptible to similar feelings when observing the dramatic evidence of destruction broadcast by NHK. In addition to illuminating initial emotional responses to the earthquake and tsunami, this exemplar reflects the seemingly universal tendency to question the meaning or purpose of cataclysmic events resulting in massive loss of life. In referring to tsunami victims as “close family,” Iori’s narrative conveys a sense of interconnection between self and others which typifies Japan’s holistic society (Kim et al., 2010).

A radiological disaster. While reading internet news headlines, Iori struggled to come to terms with the emergent nuclear situation.

This is real. This is the reality. Earthquake, tsunami, and nuclear. The huge headline changed almost every 30 seconds. “All power lost in Fukushima Daiichi, Daini, and Onagawa.” “Evacuation order in 2km area.” I wanted to know more. I typed F5 impatiently but no detailed information was given. However, every time I restarted the page, the headline became more serious. At 21:23, evacuation zone became 3km. I thought, “Is it far enough?” Around 21:30 other news sites started saying, Roshin Yoyu. Roshin means fuel. Yoyu means melt. At that time, I still thought Roshin Yoyu was slightly different from Meltdown, and it’s less severe than that. It can not happen in Japan. I had heard the word “meltdown” from a Godzilla movie.

Reminiscent of fictional movie plots, the term “meltdown” used in the context of a real-world event becomes perceived as surreal. As this exemplar suggests, the lack of a suitable reference frame complicates the ability to interpret and synthesize this crucial

information. While Iori possessed the scientific background necessary to grasp the significance and potential ramifications of a nuclear meltdown, public awareness of risk remained negligible in the first days of the disaster.

... That night, 5.15 million people were stuck in Tokyo. I was lucky to be able to come home on foot. News reporter saying the streets were stuck, it was difficult to move. Everyone was watching their mobile phone to get information, so it's very slow. ... I finished dinner, had a heater and I even had Facebook. I became like a traffic information center. Everyone asked me if JR was working or what public bus was working. ... It was like this because they can't find information from Japanese website, or they were closed. People asked their friends overseas and they seek for information on Facebook. I collected information from NHK or TBS and distributed it on Facebook. My information was transferred to Japanese in Tokyo to help them make up their mind to wait on the cold street, or drink at a bar all night long. This is the beginning of Fukushima Diary.

In illustrating the logistical barriers people encountered in attempting to return home, exemplars reveal the inherent difficulties of quickly evacuating millions of people. In September 2011, Prime Minister Kan described having contemplated evacuation of Tokyo ("Tokyo Faced Evacuation," 2011). In March 2011, Kan instructed officials to conduct simulations involving evacuation of those residing within 250km of the Daiichi plant, but ultimately concluded the ensuing chaos precluded such an attempt.

This was the moment when the "new media" got attention and used its power. On Ustream, you see streaming on the left side of the screen, and twitter rolls on its right side. Streaming was repeating tsunami report, twitter side was talking about something totally different. It was about the risk of nuclear explosion and depleted uranium in Chiba. About 5800 people were in the conversation. Most of those warnings were denied and labeled as "harmful rumor." Even I thought it was a lie, but after all, they were all true. All. If everyone took those anonymous warnings serious, millions of lives would have been saved.

This exemplar suggests that the value of social media depends in part on the number of people actively participating in exchange of information. Despite disagreements concerning the interpretation of breaking news reports, access to social media served as a resource for those seeking to resolve uncertainty amidst chaos.

I didn't turn off the light. Put shoes, canned food, and torches into a bag; left it beside the bed. Took down everything on the wall to the floor and slept in aftershock. Around this time, in reactor 1, fuel rods were already melted, and only waited to explode.

Iori takes the precaution of preparing a bag of supplies, but similar to those stuck in Tokyo, he lacked information on how to act. While Iori's perspectives changed dramatically in a period of ten hours, not everyone experienced so significant a transformation.

A widening schism. At 10 a.m. on Saturday, March 12th, Iori awakens to the phone ringing. He observed that “birds are tweeting and it was another beautiful day of spring.” Everything outside appears normal. “It was my mother. She was angry for my selfish behavior and told me to be more responsible.”⁷

What surprised me was that she didn't know anything about Fukushima. I didn't know [much] either, but she was still at the point of “earthquake and tsunami.” This little gap grew bigger and bigger, and teared Japanese into two groups after all.

The cultural imperative to be “responsible” and the widening schism revealed in this exemplar become central to several themes identified in this study. As Caudill (1973) and Morris-Suzuki (1995) note, the Japanese population strictly adheres to exacting behavioral expectations. In societies where people possess an interdependent self-construal, constraining autonomy and personal opinions for the sake of fitting in and preserving harmony remain crucial (Markus & Kitayama, 1991), which explains why cultural expectations for behavior became quickly reasserted in Japan following the disaster.

Turned on the PC. TBS, Fuji, they were all still reporting tsunami disaster, but obviously nuclear accident was more important because it was/is still going on. Only NHK was reporting it. Evacuation zone was already 10km from Daiichi and 3km from Daini. NHK reported the container vessels are heated, but the fuel rods

are still safe. They were “venting” but this is nothing serious. They had “specialists” explain the situation. Soon after I observed them speaking, I understood they didn’t know anything, and probably they were not the specialists. It was only the “tone” of their voice to try to calm us down. I really wanted to know what was going on. Stared at PC for hours.

The criticality of events at Fukushima Daiichi ultimately overshadowed news concerning conditions at multiple reactor sites in Japan, but based on analysis of narratives, the protracted reliance on backup diesel generators and rumors of damage at the Daini, Onagawa, Tokai, and Rokkasho nuclear plants exacerbated public uncertainty and fear in the early days of the disaster. As illustrated by the above exemplar, when experiencing cognitive uncertainty, people confronted with a potentially threatening event become motivated to engage in information-seeking behavior (Goodall & Reed, 2013; Rimal, 2001; So, 2013).

I was replying to tones of emails and comments to worry about Japan. An email came from my friend in US. She was so concerned and told me to go to west. At this time, CNN and BBC were doing great job, and it was easier to access information outside of Japan than in Japan, but I thought she was panicking because she didn’t know “how peaceful it looks” here.

According to Omer and Alon (1994), the normalcy bias involves a predisposition to seeing information consistent with existing beliefs, and ignoring information contradictory to these beliefs. Even Iori was not free from the influence of normalcy bias in these early days.

My feet were still sweaty and cold; was feeling very anxious, but didn’t know why. All of the sudden, the NHK reporter stopped reading news and said, “Something seemed to happen at reactor1. At 15:36, reactor1 had hydrogen explosion.” It was the moment to know I was deceived all through my life. The voice of NHK reporter was shaking, which I had never heard. For some reason, NHK did not capture the moment of the explosion. NHK reporter compared the picture of reactor1 of 15:45 p.m. and 8 a.m. The reactor building was blown off, yet the “experts” were saying, “The building was designed to be blown off to protect container vessel. This is nothing harmful.” The NHK reporter ignored him [the “expert”] talking, and said “Please stay in house. Close the windows, turn off

the fans and air conditioner, and put wet towels on your mouth when you have to go out.” This reporter was relegated [fired] a few weeks later. Since the morning of March 12th, NHK and other mass media started the worst media black out in our history.

Nuclear energy is promoted as a safe technology, a concept reinforced by the relative infrequency of significant radiological disasters. When Iori concludes that he has been deceived his entire life, he refers to official reassurances concerning the “impossibility” of a nuclear accident occurring in Japan. Exhibiting a high standard of personal integrity, several NHK reporters violated censorship demands in the interests of providing crucial warnings to the public.

During mid-noon news broadcast, NHK Director stopped an announcer reading the news about exposed fuel rod assemblies. (Whisper): “Don’t read this draft about exposed fuel rods.”

An NHK reporter Nomura Masaiku announced, “At 11:40 on 3/12/2011, fuel rod assemblies are exposed about 90 cm above the pool of reactor1. It is really a dangerous situation. Currently Tepco is planning to give 27,000 tones of water by using pump for fire extinction, etc. I’ll repeat ...” At this moment, on 0:45 on this video, the announcer stops and the mike catches the voice of director to say “They say you mustn’t read this draft.” ... After 4/4/2011, this announcer was sent to local NHK station in Fukuoka from Tokyo central studio.

The rare glimpse of explicit censorship likely contributed to viewers’ general suspicion of traditional media disaster coverage. Iori’s subsequent decision to share a written account of this incident reflects a growing awareness that documenting the existence of censorship serves as a necessary precursor in persuading others of the severity of risk stemming from the Fukushima disaster.

As news of this first reactor explosion spreads, Iori’s friend expresses increased concern for his safety.

My friend in US was almost shouting, get out, get out, get out! I knew she was right. I felt adrenaline was running through my blood, but to where? What should I do with those turtles? What should I do for my job? Evacuation seemed too

unrealistic. I couldn't stay, but I couldn't go. I was so isolated from information like everyone else. We really needed more information.

People require time to process information prior to acting. While Iori has since become a vocal advocate for evacuation, this exemplar reveals the difficulty of adapting quickly to a sudden shift in reality. Concluding at the time that evacuation remained unrealistic or impossible, Iori continued to focus on gathering and sharing of information.

At first, [newspaper companies] didn't even report it exploded. Instead, "explosive sound was heard, white smoke is coming up." If someone really wants to deny the truth, he would think, "it was just a sound, not an actual explosion." At 20:20, Self Defense Force or Tepco staff starting injecting sea water to the pressure vessel. They injected sea water into reactor 1. That was obvious that Pacific Ocean would be severely contaminated, but I wasn't confident in my own judgment.

The technical complexity associated with a nuclear disaster represents a significant barrier to public understanding. Illustrating the importance of interpersonal communication in overcoming such barriers, Iori contacts a friend and former classmate working as a genetic engineering researcher at Tokyo University to discuss these concerns.

He said, "Once they put sea water into the reactors, that will be ok. And the politicians are still in Tokyo. That means its safe here." I honestly was surprised at his immature sense of judgment. I even thought it was me to be crazy, but after all, he was proven to be wrong. By 3/13/2011, the current situation was already set up. People to think Fukushima was nothing vs. people to think Fukushima is crucial. At this time, I was almost the only one to worry about Fukushima. It was only reactor 1 to explode, but I was already starting to think about evacuating abroad.

A group mindset. After the emotional intensity experienced in the first few days waned, people began to cognitively reflect on the significance of what had occurred. As Iori explains, "having gone through the disaster ... beyond our imagination, human mind wanted the reason."

This is like the starting process of religion. Majority wanted to associate it [the earthquake and tsunami] with their personal decadent lifestyle. They wanted the simple logic, “because we did something bad, we were punished by god of earthquake.” Obviously this mentality doesn’t last long, but it had the harmful aspect from the beginning – Underestimate Fukushima. They overrated tsunami and earthquake, criticized people to concern about Fukushima for not devoting to “atonement.” The slogan of “Support North Japan” was born at this moment, and it got the disguise as atonement by taking the risk of radiation exposure willingly, and grew to be the group mind which is killing the whole society right now. At the beginning it was only volunteer. Now it’s to accept debris, consume contaminated food, and staying in the contaminated area.

Even in individualistic societies, “group think” exerts pressure to conform.

Despite mounting evidence of contamination in food, narratives suggest the pressure to support northern Japan by eating produce grown in Fukushima became reinforced by accusing those resisting or repudiating this message of spreading harmful rumors.

Consistent with the centrality of consensus and harmony within Japanese culture (Caudill, 1973; Dueck & Byron, 2011; Yamamura et al., 2003; Yamashita & Williams, 2002), the atonement perspective of this group mindset exerted a chilling effect on expression of contradictory perspectives.

Even on Facebook I was criticized to spread the “harmful rumor” about Fukushima. They say it interrupts the support for North Japan. ... Even volunteer people got exposed to go to the disaster area without knowing anything. However, I wasn’t allowed to talk about this.

This wrong view originates from the lack of historical knowledge. From the Russo-Japanese War in the beginning of the 20th century, it has always been the Japanese custom for people to be killed by the suicidal strategy. It is famous that the government tried to make Tokyo citizen fight against American bombers during WW2 with bamboo spears. ... Now the worst public pollution has started. People were blinding themselves. Some were even thinking it looks brave and heroic to act like they don’t care about radiation. ... I quit discussing. I had no other choice to post correct information and gain trust of people step by step. Anyway, I understood the world has changed. I sealed up the windows. I had no place to hide. If you have a nuclear accident in your country, this is what you’ll see.

The resurgence of an historical custom involving the government's expectations for public self-sacrifice described in this representative exemplar suggests that typically prescriptive expectations for a public sense of obligation and willingness to engage in self-sacrifice (Caudill, 1973) take on a more proscriptive nature within the context of a crisis event. Prescriptive norms function to encourage people to engage in positive behaviors, while proscriptive norms function to prevent people from enacting behaviors deemed inappropriate (Janoff-Bulman, Sheikh, & Hepp, 2009). In this light, accusations of spreading false rumors and criticism of contradictory points of view described in multiple narratives reflect condemnation of the failure to adhere to proscriptive norms. While prevalent criticism initially chilled expression of contradictory views, over time those living in Japan began expressing such views despite potential criticism, motivated by an increased perception of threat.

Increasing Perception of Threat

While analysis of data indicates that information seeking behavior varied considerably across the population, following the nuclear explosions many of those living in Japan sought and shared information concerning the potential health threat(s) posed by the radiological aspects of this disaster. This second theme focuses on the nature of information people relied on to assess the potential health risks, and the resultant assessment of threat based on information obtained. Three primary categories of information exchange emerged: (a) monitoring of conditions at the Fukushima Daiichi Plant, (b) measurements of contamination levels in the air, food, water, and soil, and (c) accounts of illnesses and fatalities attributed to radiation.

Monitoring of conditions at the plant. Due to limited access, information concerning conditions at the Daiichi plant primarily came from plant employees (whistleblowers), Tepco press releases, reporters allowed to tour the facilities, and from those monitoring the live streaming webcams situated at the Daiichi site.

Xenon-133 and -135 are measured at reactor2. Xenon is daughter of uranium 235, half life time is 5.2 days (xenon-133) and 9 hours (xenon-135). It proves the nuclear fuel is fissioning at reactor2 still. Tepco has started injecting boric acid solution into the (broken) reactor. At reactor2, Tepco finally started analyzing air filter of the container vessel on 10/28/2011. As the result, they detected xenon-133 and -135. It may have been fissioning since months ago.

- Fukushima Diary analysis of news

Those seeking a better understanding of the potential threat associated with a nuclear disaster invariably encounter challenges in interpreting information of a highly technical nature. As illustrated here, by providing information in a manner conducive to public understanding, alternative media content functions to bridge this gap by empowering readers to engage critically with media content (Harcup, 2005, Kelly, 2011; Sandoval & Fuchs, 2010). Isolating the objective information conveyed in this example, Tepco reported discovering xenon in an air filter. If traditional media had reported the discovery, the audience would likely fail to grasp the import of the factual information provided. By incorporating analytic, interpretive, and even speculative content, alternative media enables readers to more readily grasp the potential ramifications of such discoveries. In this instance, for example, learning that the presence of isotopes with a short half-life represents confirmation of a recent fission event, the public becomes equipped to interpret subsequent technical reports, including more objective accounts published in traditional media.

According to Iori Mochizuki, in November a Tepco worker who “had sanity enough to think Tepco and the government should reveal the truth,” invited a journalist – Mr. Imanishi - inside reactor building No. 4 at the Daiichi plant. The following exemplar comes from a translation of this *Shukan Asahi* journalist’s video report.⁸

The wall and the ceiling of the building was completely blown off by “some explosion.” The spent fuel pool is totally left outside, out of control so what you can even see it from out of the reactor. He states, the wall of the reactors are about 1m thick of huge concrete mass. It is blown off. It shows how much the explosion(s) were more massive that they were announced by the government. He also states, he heard ambulance comes to the plant at least for 10 times a day. When he comes back to Tokyo, he loses the sense of reality. Though he saw the massive debris of the Fukushima plants, but people live normally as if nothing happened in Tokyo. He even doubt if he saw dream in Fukushima, but it is true, and life in Tokyo is fake. From what he observed, pipes and facilities are made of vinyl. The leakage of today may happen very often.

Tepco coordinated multiple media tours of the plant between 2011 and 2013.

While data included several journalists’ accounts of conditions at the plant, the above exemplar highlights the variability in public awareness during the first few months following the nuclear explosions at Fukushima Daiichi I. In describing the experience as surreal, the journalist illuminates the difficulty encountered when attempting to reconcile awareness of what occurred with the actual reality after having witnessed such damage firsthand. While monitoring conditions at the Daiichi plant remained important, people seeking to assess potential threat primarily exchanged and relied on measurements of contamination in food and accounts of emerging health problems.

Measurements of contamination in food, water, air, and soil. Analysis of data suggests sharing of information concerning contamination levels in food, air, drinking water, and soil obtained from a range of official and independent sources began almost

immediately following the explosions at the Daiichi plant. Individuals purchased Geiger counters and shared what they found online.

I went to the supermarket with a Geiger counter. The reading increased as I entered there, even more increase at the vegetable section. I know that Geiger counter can't measure foods, but a bit scary.

- @ Osaka (west part of Japan)

While inexpensive Geiger counters detect only a fraction of radiation present in food or environmental samples (Alpeyev, 2011; Sythe, 2013), measurements provide an important indicator of overall contamination.

About three-tenth of the corn produced in Fukushima tested for cattle consumption. The highest Cesium 117 Bq. However, for human consumption, nearly all are "no detection." Busted for a low standard of food testing.

- bigapplecake

A shrubbery about 2~3 minutes by walking from the Yurakucho station. It was about 0.60~0.74 Micro Sv/h. Sr-89,90: 51 bq/kg. Cs-137: 11,545 bq. Cs-134: 9,410 bq.

- sample analyzed by private lab 10/26/11

Data reflects a general public distrust concerning the rigor and veracity of official testing of food products. As a result, samples are occasionally sent to independent laboratories to obtain more precise measurements. A non-profit organization, "Team Nihonmatsu," having discovered cesium in a popular baby formula, shared these results with the traditional media. The following exemplar comes from a December 2011 analysis of traditional media coverage of this story published in Fukushima Diary.

Japanese prime minister has baby formula in front of camera. They measured 30.8 bq/kg of cesium from baby formula called Meiji. Meiji, one of the major Japanese milk product companies, is going to change 400,000 products for free, though its under the "safety limit" of 200 bq/kg. Because the sensitiveness of babies are 100 times higher than adult for radiation, 30.8 bq/kg is actually bioequivalent of 3,080 bq/kg for babies.

Enabling public understanding of this news item, Iori Mochizuki explicitly identifies what he considers the most important implications of this report.

First, it became news. Having 4 nuclear plants exploded, it's very rational to think all kinds of food have been contaminated more or less. Radiation is not sweet enough to avoid baby formula. Thought it is this obvious, most of the Japanese people were surprised. They still have not noticed the entire risk of the Fukushima accident.

The source of contamination is "air." The powdered skim milk was made in Oceania area such as Australia. A part of it was made in Hokkaido. From 3/14-3/20, they processed it in Kasukabe Saitama. The process is to dry the powder by taking air from outside of the factory. It is likely the baby formula was contaminated in this process. If not, they lie about the origin of the powdered milk. [Because] cesium localizes in your heart and causes cardiac infarct, etc., as little as 20 bq/kg, if you have it everyday, your body stocks 2,000 bq. in total within 200 days.

This representative exemplar conveys a persuasive tone identified frequently in content published in Fukushima Diary throughout 2011. By describing the public's surprise upon learning of contamination in baby formula, this content explicitly justifies this persuasive tone relative to the population's general lack of awareness of risk. Beginning in 2012, the persuasive tone of articles gradually decreases, indicative of a corresponding increase in public awareness. As the content of the above exemplar reveals, globalization and industrial-scale production of food products creates difficulty in identifying the source of ingredients, complicating public efforts to reduce the risk of internal radiation exposure.

Leary of measurements reported by local and national officials, people sought to confirm or refute such data.

A person I know who is a female office worker for Tochigi Prefecture's water department told me, "Because we don't want to frighten people, we've been misrepresenting radiation detection levels. The actual values are about 4 times the levels we've been reporting.

- Tochigi resident

Multiple examples of deliberate manipulation of radiation measurements identified in data subsequently became confirmed when concerned citizens paid for independent laboratory testing of samples. While the veracity of official reports remained unchallenged when measurements reflected acknowledgement of a more severe threat, inclusion of interpretive content in Fukushima Diary articles supported increased public understanding of the implications of information reported.

Ministry of the Environment (MOE) is going to legalize dumping incinerated ash which is over 100,000 Bq/kg. into landfills. They are allowed to dump incinerated ash of 8,000~100,000 Bq/kg into landfills since this June. Now that they have legalized it, there will be no limit to the levels of contaminated incinerated landfill. MOE made it a condition to shelter it with concrete and do the best to separate it from groundwater.

- Fukushima Diary analysis of news

According to Morahan-Martin (2004), people rely on information obtained from online sources to fill knowledge gaps, enhance self-efficacy, and facilitate decision-making. In data analyzed, many people described avoiding or limiting seafood and seaweed because of radiation released to the sea, and avoiding mushrooms because these became highly radioactive following the Chernobyl disaster (Yablokov et al., 2010). Many parents described purchasing only imported drinking water for children after becoming fearful when iodine was discovered in tap water following the nuclear explosions. Possession of information concerning contamination in specific geographic areas or in certain food contributes to self-efficacy because the public can use this information to limit exposure.

Accounts of illnesses and fatalities attributed to radiation. Over one hundred narrative accounts of health related problems exist in data analyzed. In data published in 2011 alone, fifteen distinct health conditions anecdotally or scientifically attributed to

radiation exposure were identified, including bura bura,⁹ leukemia, birth defects, miscarriage, cerebral meningitis outbreaks, chronic nose bleeds, heart disease, failure to thrive (cessation of growth in children), thyroid disease, and Fukushima AIDS.¹⁰

Narratives suggest that suspicion of radiation induced health problems contributed significantly to an increased perception of high threat severity and imminence. Reports confirming internal exposure through independent testing contributed to public concerns.

Dr. Tsuji in Tokyo tests radioactive material contained in nails of Tokyo citizen. He published a data of a sample which contains uranium. He collects cut nails from applicants and test it in a German lab. According to him, they found cesium, strontium, uranium and mercury are also measured. He once tried the same test for Fukushima people, but the result was terrifying. Some of the materials went over the limit of measurement, he said. This sample is from a person living in Tokyo. However, only tiny a part comes out to nail or urine. More radioactive material is stocked in our body. We are becoming nuclear fuel rods.

- Fukushima Diary analysis of news

A mother from Miyagi, suspicious about a recent confluence of health problems, shares her story. Despite attempting to avoid food grown in eastern Japan, this woman's tragic account conveys an experience representative of many narratives contained in data.

I am a housewife living in Miyagi prefecture. ... There are three phenomena which I would like to report. First, I was pregnant at the time of the disaster. On March 11th, at 9 weeks of pregnancy, it was the time of morning sickness. As it was "tabeoso" (needing to eat constantly in order to avoid nausea), I consumed whatever I could put my hand on. ... When May arrived, I went to the prenatal care testing ... and there, anencephaly¹¹ of the fetus was detected. ... The immediate hospitalization for an abortion was inevitable. I was devastated as my child had been affected by this one out of tens of thousands deformity. Thereafter ... I became aware of the symptoms that are connected to endometriosis.

I have a two year old and ... to protect this child, we tried the best to spend the time indoors and had been mindful of the origin of beverages and food. In July, ... the two year old came down with sudden onset of strong abdominal pain, then diarrhea and bloody stools. This is the second incident. We rushed him to hospital and the diagnosis was intussusception.¹² Anesthetization was given immediately to treat the symptoms. ... His intussusception this time was explained to me that even though the rarity of onset at the age of two was recognized, well, it did

happen rarely. Why my children are threatened by such life's dangers? The thought made me deeply depressed.

The third incident is a sudden death of our pet dog. ... The cause of death, cardiac hypertrophy. The dog loved playing with the rocks in the garden and played always rolling in the dirt. It was hard to believe that it lost a vigor suddenly and died within a day, as it was playing hard and eating well until the day before.

The woman's decision to share this story via Fukushima Diary reflects a general confidence in the suspicions described in this account. Thus, the presence of numerous modifiers (e.g. "These may not be related to radiation, and really is a coincident, but I would like to report as the unlikelihood of probabilities of these succeeding events make me suspicious") suggests a hesitancy in publicly expressing these suspicions, rather than doubt concerning the possible correlation. Whether the motivation to share this story stems from a desire to raise awareness of the potential severity of risk, or to obtain objective confirmation of expressed suspicions, the significance of this exemplar resides in the increasing prevalence of accounts documenting a similar series of unlikely or rare health conditions and/or genetic mutations experienced by members of a single family.

News of sudden fatalities involving young adults and children with no prior health problems contributed to the population's growing perception of risk.

In Tomitsushi, Chiba, a 13 years old student died suddenly. They suspect it was lung bleeding. He joined table tennis club. He finished his running training for a few km. After having a rest at the school gate, he fell down on 12/10/2011. It was confirmed that he passed away on 12/12/2011. He did not have a chronic disease. He did not claim any physical disorder before the training either.

- Chiba citizen

More details of the person who died of acute leukemia came. He was called Kazu, dedicated himself to save as many animals as possible in the 30km [evacuation] area. He even went into 5km area. He was updating his blog almost everyday, but he told us he got sick on 7/31. The next day, they diagnosed he has acute leukemia. One week later, he died.

- Fukushima Diary news

Ex professional soccer player Matsuda lost his consciousness in a training game. Sent to a hospital but cardio-respiratory arrest.

- Fukushima Diary news

Sudden fatalities involving children, athletes, and those known to have lived or worked in an area proximal to the Daiichi plant became circumstantially attributed to radiation exposure. As a result of engaging in information seeking behavior, the public became aware of documented correlations between cesium exposure and heart attacks, strontium exposure and acute leukemia, and iodine exposure and thyroid cancer, but in the absence of extensive postmortem testing, people remained unable to verify the growing suspicions.

Testifying before a compensation hearing, a voluntary evacuee describes his family's experience. Living in Koriyama, his wife became pregnant in April 2011. After learning from a doctor in July that her babies may be born as conjoined twins, the family evacuated to Shizuoka, Japan in August 2011.

I promised not to talk about this with my wife, but thinking that telling the truth is important, I'll confess this here. When it turned out that our babies may be conjoined twins, my wife asked me if she can bear them. I was, "sure, of course." A couple of days later, I found my wife crying in front of family altar. Photos were put there, but they were screwed. I cried with her too. Our bedroom was a hot spot. The connection between this and radiation will never be clear. However, the fact is, she resents nuclear industry and their all stakeholders.

Representative of multiple accounts of birth defects, miscarriages, and stillbirths identified in data, the above exemplar illustrates a clear recognition of the association between radiation and specific birth defects. In a separate account, a maternity nurse in a Tokyo hospital defies government orders to remain silent when she describes seeing more children born with birth defects in a single month than she encountered in the previous five years working at the same hospital. Several women described having undergone a

precautionary abortion following the Fukushima disaster, while other women described a fear of becoming pregnant in the future.

Increased concern over emergent health problems and birth defects attributed to radiation exposure identified in data reflected a growing perception of high threat severity among the general public by late summer of 2011. Particularly susceptible to radiation-induced health problems, the most frequently reported chronic conditions identified in data involved children suffering from perpetual fatigue, daily bloody noses, and gastrointestinal problems. Generally hesitant to attribute common health problems to radiation exposure, parents described arriving at such conclusions when previously active children displayed little to no improvement over time. Those seeking medical attention perceived doctors as unwilling and/or unable to acknowledge the potential correlation between illness and radiation, and expressed concern that the medical community's failure to acknowledge a possible correlation prevented people from obtaining an accurate diagnosis and necessary medical care. Partially confirming this perception, data reveals that several courageous doctors and academic scholars in Japan have spoken out against official policies designed to minimize public concern about radiation. Increased awareness of deteriorating conditions at the Daiichi plant, contamination of food, and potential health consequences contributed to a heightened public perception of threat severity, and as a result, people living in Japan described becoming increasingly angry with those expected to protect the population's wellbeing.

Betrayal and Systemic Domination

This theme focuses on affective and cognitive responses identified in conjunction with narratives reflecting an increased public awareness of the potential severity of risk

associated with the Fukushima disaster. The expressions of anger, outrage, and incredulity identified in narrative accounts published in August 2011 onwards suggest a growing perception that those in authority intentionally misrepresented, minimized, or concealed facts concerning the severity of the threat, hindering the public's ability to engage in protective action. Expressions of anger identified in data principally involved the actions and/or inactions of those expected to safeguard public wellbeing, including (a) government officials, (b) traditional media organizations, and (c) school administrators.

Government officials. Reports confirming that government officials possessed but withheld relevant information from the public contributed to the sense of betrayal identified in narrative accounts.

[The] hidden ugly truth is revealed day after day. Today they revealed that cabinet knew meltdown was happening, serious amount of radiation was already leaking just after the earthquake, but they kept people stay near nuclear plants and let them seriously exposed, and Chief Secretary of Cabinet Edano even announced radiation is not leaking. Also, Tepco's employees and their family dominated all the buses from Fukushima to evacuate just after 311, other people had no clue to evacuate. They also blew the whistle that Edano had his family evacuate to Singapore just after 311. How many people and potential lives are forced to die because of his dishonestly? I am writing this to make you angry.

- Fukushima Diary analysis of news

Published in mid-August 2011, this exemplar not only captures Iori Mochizuki's personal sense of betrayal, but reflects a desire to persuade others to arrive at a similar conclusion. As public concern about the potential threat posed by this disaster increased, the gulf between public perceptions and government reassurances of safety widened. The persuasive tone in narratives illustrates an interest in resolving dissonance associated with this disparity by highlighting the perceived lack of veracity displayed by government officials.

Die of starvation or die of cancer. They say they check radiation, but they only check a few kinds of radioactive material among tens of nuclides. It's not only food, but also rain and soil. Contaminated water comes back in rain and it never be tested. They have been deceiving us since 311. They kept deceiving us and pushed us to hell. I have no clue why still so many people think government is honest and right. Government is a liar. They are trying to kill us. Whether it's easy for you to accept or not, this is the reality. I don't want any more people to be deceived and die.

- Iori Mochizuki, Fukushima Diary

The above exemplar highlights a widespread realization that decontamination efforts remain largely ineffective. Often described as decontamination theatre rather than a genuine solution, data reflects an increased sense of anger concerning government reassurances of safety based on such efforts. As a result of public efforts to monitor contamination in food and water, detection of levels consistently higher than those reported by government officials becomes perceived as evidence of official deception. Analysis suggests that expressed anger over potential deception arises in conjunction with a public perception that a lack of reliable contamination data poses a significant barrier to engaging in protective action.

Ministry of Health, Labor, and Welfare conducts a patient survey every 3 years. However, it turned out they eliminated the data of Fukushima and a part of Miyagi from their statistics this time. According to the Japan Medical Association, since this April to October, leukemia cases have increased by 7 times over last year. Chairman of Medical Association said the connection between this unusual increase of leukemia cases and the Fukushima accident is not clear. 60% of the total leukemia cases are acute leukemia. This is the highest ratio since 1978. 80% of the patients are from Northern Japan and the Kanto area. Fukushima has the highest rate, while Ibaraki, Tochigi, Tokyo follow. To clear up this "confusion," a Japanese citizen asked Ministry for the truth, to which they replied that they take all patients statistics but that this year they eliminated the data from Fukushima and a part of Miyagi from the whole statistics report. They say it is to support the reconstruction of Fukushima and Miyagi.

- translation of anon twitter post

Data suggests that a perceived lack of official transparency motives individuals to become amateur epidemiologists. As the representative exemplar above illustrates, an individual suspecting a possible correlation between cases of acute leukemia and proximity to the Fukushima Daiichi plant decides to collect statistics in the hopes of identifying a pattern. Serving as a resource for others seeking to assess risk and engage in protective actions, the presence of amateur epidemiological efforts reinforces the perception that the absence of similar research conducted by the government evinces an official lack of concern for public wellbeing.

Interestingly, government data collection efforts become suspect. One particularly controversial form of official research involves equipping children with sealed glass dosimeters worn around the neck. Design features make it impossible for parents to read these dosimeters; instead, parents receive a monthly report after local officials read and record dosimeter results. Aware that monitoring of a child's monthly exposure offers no protection from harm, a number of parents express anger over what they describe as the government using the children as lab rats. Uninformed of the official purpose of this research, some parents speculate that data informs decisions on potential expansion of evacuation zones, whereas the following narrative reveals a growing public concern that the primary purpose involves an official desire to control public fear.

Fukushima local government distributes dosimeter to children and collects them every month. They are supposed to check the radiation dose for one month and send results to the families. However, one family who didn't send the dosimeter to local government received a "result" and it said 0.2 mSv/m. It reveals 2 important facts: (1) they ignore internal exposure, and (2) they don't check dosimeter at all. They only return random numbers.

- Fukushima resident

People accustomed to perceiving the government as benevolent understandably find it difficult to accept the notion that the government acted against the best interests of those living in Japan. As illustrated by the above exemplar, people remained willing to accept the monthly reports at face value until one parent received a report despite forgetting to turn in the dosimeter. Yet because official assurances of safety contribute to public inaction, people unable or unwilling to question these reassurances remained unmotivated to engage in protective measures.

Before deciding how to act in response to a potential threat, people first seek to better understand the nature of the threat faced (Witte & Allen, 2000). In the process of reconciling contradictory information, some individuals began questioning why officials felt the need to misrepresent or conceal facts associated with this disaster. As reflected in the following series of exemplars, the potential enormity of negative economic consequences represents a possible motivation for official attempts to minimize public perception of risk (Omer & Alon, 1994).

Why is the government so eager to conceal the fact? It is the core problem of this whole disaster. The actual problem, which is as serious as radioactive contamination, is where to move the 30 million from around Tokyo? World has totally changed. We must accept the fact.

The metropolitan area is one of the mega economic centers in the world. Even if it's temporary, stopping it functioning... can be a trigger of another economic crisis, [so] they chose slow death. ... The person who measured Sr-90 in Yokohama was threatened. Not to let people evacuate from Japan, and to save domestic companies, Japanese government has raised the "safety" limit of food with no scientific basis. Some of the researches show the contamination level in Tokyo is worse than the evacuation zone of Chernobyl.

In the instance referred to above, public disclosure of high levels of radiation measured at a local supermarket resulted in the subsequent discovery of large radioactive particles on the roof and in the surrounding soil, ultimately necessitating a costly

decontamination process and precipitating official acknowledgement that the initial reactor explosions dispersed radiation further than previously hypothesized. Analysis of data reveals that people exposing high levels of contamination frequently became the target of threats levied by official and anonymous sources.

None of the governments will admit the fact. Japanese, American, French, anywhere. Why? Because ... Japan is almost 30% of the world [economy]. They will never admit the fact that Japan is literally dying until the very last moment. Whatever happens, no matter how serious it becomes, Japanese government will assert it has nothing to do with radiation. It affects US economy, China, EU, and all around the world. Most of American national bond is owned by Japan and China. Most of the savings of Japanese people are invested into Japanese national bond by major banks because private sector is not expected to grow, and the Japanese government invests the money into American national bond. As a matter of fact, America, Japan, China, they are all one unit.

- Iori Mochizuki

The above exemplar reveals the crux of Iori's analysis of the dilemma confronting the leaders of Japan: saving the people (through evacuation) threatens the economy, and saving the economy requires the sacrifice of public wellbeing.

Systemic domination. Describing his interpretation of Japan's predicament, Iori suggests that because national economies are intertwined, the potential consequences of an economic collapse in Japan would extend far beyond the borders. Recognizing that the "authenticity of the government is strongly connected to the value of yen, national bond, [and] value of land," the Japanese government cannot reveal the truth even if they wished to because of external pressure exerted in the interests of preventing further damage to the global economy.

Now more and more people are hostile to the government. Some of them even try to kill pm [prime minister]. But the problem is not that simple. The problem is domination. Domination of power, domination of mass media, domination of economy, and domination of domination.

Fukushima is a symbolic problem related to domination. If you want to fight against those who get benefit by concealment, it requires a total change of the world[view]. Obviously Japanese nuclear strategy is strongly connected to USA, IAEA, and UN, so ... what we are fighting against is ... the international nuclear industry. Tepco, Japanese government, US government, IAEA, UN, they are all tied up under the industry. They mine uranium, enrich it, and make plutonium with our bills of electricity. They make nuclear weapons. Recently it's fashionable for them to make depleted uranium ammunition. They are troubled if they can't sell their products. ... Therefore, if we report Fukushima as it is, and if they [the Japanese government] fail in downplaying it, they have trouble.

Nuclear power plant is the plutonium factory. Having nuclear facility means you are always ready to have nuclear weapons. It's not that you need nuclear weapons because you have enemy – it's that you need enemy because you have nuclear weapon to justify yourself. Poor local governments wanted nuclear power plants for lots of corruption money. It produced more job opportunities. They were all paid from tax and electricity bill, which is totally out of market rule, so the local governments were more and more addicted to the nuclear economy.

Joseph Trento's (2012) twenty year study of Japan's nuclear history, published the following year, lends support to Iori Mochizuki's characterization of the vast power and influence exerted by the multinational energy and nuclear weapons industries, and the dual-use nature of Japan's nuclear energy program.

The reality in Fukushima and the future of Japan is overwhelming. The public execution has begun in Fukushima, like in Minamisoma. Now Japanese people are confused. They are finally understanding the risk. ... Since 311, I'm possessed by anger. I would be willing to die if I can let the world know Japanese government is a liar. They are murderer. Do not trust them.

- Iori Mochizuki, Fukushima Diary

In describing this disaster as symbolic of systemic domination, Iori Mochizuki's interpretation reflects an holistic synthesis (Kim et al., 2010) of a complex series of events which decisively conveys the depth of anger expressed in multiple narratives. Published in autumn of 2011, these narratives suggest that when the scales fall from one's eyes,¹³ a sense of betrayal emerges.

Traditional media organizations in Japan. Analysis of data reveals a common public perception that local media organizations follow the government's lead in deciding how and what to cover. Normally unaware of the subtle media techniques employed to influence public perceptions, people focus more intently on what stories the media fails to cover when the subject involves a matter of growing public concern.

The media don't tell Tepco is concealing something we should know. Looking as if they were telling everything, they hide the most important facts. Ordinary audiences don't even know what they don't know. This is a sophisticated way of media blackout. It's negligent of them to ignore the upcoming health risk, which is probably the biggest in human history. Sometimes they report on and make documentaries about Fukushima. However, I can't help finding those a little bit too emotional. ... Japanese media often focus on the mental aspect of evacuees or nuclear disaster victims, but it is not the true nature of the problem. What the media should do is ... keep requiring the government and Tepco to disclose information, and make original statistics about health problems.

- Iori Mochizuki, Fukushima Diary

Implied in the above exemplar, an official rhetorical strategy of attributing physical ailments to stress rather than radiation fuels public anger, and as a result, media emphasis on the emotional toll of the disaster becomes perceived as perpetuating an official strategy to minimize the association between illness and radiation. Such suspicions remain consistent with research indicating that traditional media content often serves to reduce fear and promote normalcy in the wake of technological disasters (Omer & Alon, 1994). As the primary vehicle for dissemination of official propaganda, traditional media entities remain a target of public anger, and those taking umbrage with propaganda campaigns (e.g. smile; radiation can't hurt happy people") describe feeling betrayed by the media. As the following exemplar reveals, explicit references to use of public funds to finance media campaigns contributes to public outrage.

To control the "harmful rumor," Foreign Ministry is inviting social media gurus to Japan. They are going to invest 1500 million yen into media control. They are

trying to make the gurus say Japan is safe, Japanese food is safe, Japanese products are not contaminated, ignoring the fact that the low dose symptoms take time to appear.

- Iori Mochizuki, Fukushima Diary

Criticized for not raising important questions and blamed for failing to report meaningful statistics on contamination, traditional media journalists in Japan become accused of attempting to minimize public perceptions of risk.

Ms. S., a newscaster of Fukushima TV ... evacuated to Kanazawa. She is a mother of 6 year old daughter. Though she had been working for Fukushima TV for 15 years, she quit when she knew she was pregnant with a second baby in July. As a newscaster, she was in charge of making Fukushima people believe Fukushima is safe. She reported that children ate cherries even without washing them, and had them say "yummy." She actually had her daughter evacuate in the morning of 3/14. Although she spread lies to Fukushima citizens, "She shed tears to be able to eat safe food." Though she was making people believe Fukushima is safe ... she decided to leave Fukushima. She was feeling guilty to spread lies. She also says, decontamination is a wishful thought with no basis. As a mother, her choice was right, but people who trusted her reports and decided to stay were totally left out in the cold.

Analysis of data suggests that prominent examples of hypocrisy enacted by individuals acting in an official capacity become perceived as particularly egregious. As the above excerpt indicates, even persons aware of official propaganda efforts find it particularly difficult to understand why a fellow citizen would knowingly act against the public interest.

School administrators. During a public presentation in October 2011, the leader of a Japanese non-profit organization responsible for bringing children affected by the Chernobyl disaster to Hokkaido spoke about the Fukushima disaster, saying "The world is watching the way Japan is dealing with the situation. A country which abandons its children and doesn't value their lives is not a country worthy of trust." Narrative accounts suggest the problem described by Iori Mochizuki as systemic domination trickles down,

even influencing the behavior of school officials. When food contaminated with radiation is knowingly included in school lunches served to young children, parents are understandably irate.

Recently Yokohama city government served cesium lunch [beef raised in Fukushima Prefecture] measuring 0.48uSv to 84,000 children at 243 schools, and ... admitted that cesium beef measuring 719 bq./kg. was served for 8,000 students. Japanese children have NO right to reject consuming radioactive food.

- Ms. M

Because Fukushima beef don't sell at retailers, Fukushima beef became cheaper. The cheaper they purchase food, the more they get profit. [At an emergency press conference in Yokohama] a mother yelled at the mayor of Yokohama city, Hayashi Fumiko, "You are making the children waste disposal!" However, Yokohama city council turned down all the petitions from mothers. The petitions were for not letting students visit hot spots in North Japan for school trip, conduct urine test for students who had cesium beef of school lunch, and punish city government staff who arranged contaminated food for school lunch. Currently domestic beef is served for school lunch, but Australian beef is served for the city government's cafeteria.

- Series of translated news articles

Encountering such hypocrisy – officials do not eat this food but insist school children do so - contributes to a deep sense of public outrage. Because the Japanese typically behave with deference and politeness (Caudill, 1973), and avoid expressing negative ego-focused emotions such as anger for the sake of preserving harmonious relations consistent with a collectivistic public self (Kim et al., 2010; Markus & Kitayama, 1991), this mother's public expression of anger becomes significant. In a number of narratives analyzed, people commented that when acknowledging a failure to act in the best interests of others, officials traditionally offer sincere apologies. Research suggesting that the Japanese express other-focused emotions such as compassion, sympathy, and shame to foster interdependence (Caudill, 1973; Markus & Kitayama, 1991) helps explain expressions of surprise identified in data concerning the notable

absence of such apologies in official statements following 311. The seeming absence of shame or compassion illustrated by the city council's dismissal of petitions in this representative exemplar provides an early indication of the social disruption precipitated by this disaster. Employing a contextual perspective makes possible the interpretation of the mother's behavior not as a violation of cultural expectations for public behavior, but as an indictment of perceived official disregard for protecting children from harm.

Further constraining parents' ability to provide children with alternative options only exacerbates the situation.

An elementary school in Tokyo gave out notifications to ban students from bringing their own water bottles as of October. Petitions are turned down by ward assembly. We need more citizens to act against it otherwise children will be more and more exposed; they don't even measure radioactive material of school lunch.
- Edogawa ku Tokyo parent

My daughter's junior high school did ban them from bringing their water bottle as of October either. In Miyagi prefecture, the lowest detectable amount of tap water is higher than other prefectures, but it means they want us to drink tap water.
- Miyagi parent

When schools ban students from bringing home-made lunches and water bottles to school, parents describe feeling helpless and betrayed by those entrusted with the children's wellbeing. A member of the Japanese Upper House Budget Committee provides an example of a Fukushima Prefecture teacher bullying students to consume contaminated milk.

At a school in Fukushima, some students rejected drinking milk because of risk of internal exposure. In Chernobyl, a lot of the children died of contaminated milk too. However, these Japanese students were forced to stand up and come in front of other students, and pour milk into buckets by the teacher. The teacher told them, "Give me the explanation why you don't drink milk. If you don't drink it, you are not qualified to be Fukushima citizen." This is disgusting, but this is what is happening in Fukushima schools. We need to make the children escape from the hell, otherwise they will all suffer from cancer.

- Ms. A

Analysis of data suggests that people find it particularly difficult to understand why officials knowingly endanger children by requiring mandatory participation in outdoor activities, including picnics, swimming classes and participation in marathons held in “hot zones,” activities which increase the likelihood of breathing hot particles into the lungs.

Fukushima schools had swimming class to kill children this summer [summer of 2011]. Today news came to tell about 600 schools in Fukushima can not throw the water away because it's too contaminated. The bottom of the pool looks black because of the fallout. Surface is covered with algae. The problem is - children were forced to swim in it.

Japanese government is holding a marathon relay race in Fukushima City. The radiation level is as high as mandatory evacuating area in Chernobyl. Thousands of people called the administrators to stop the race, but it ended up started. ... To attend at the race, they made the girls sign on the contract, “Even if I have health problem from this race, I will not sue the promoter (= Japanese government).”

- Fukushima Diary articles

As these examples collectively suggest, an official desire to restore a public sense of normalcy represents an increasing source of tension. The perceived disregard for the wellbeing of the youngest members of Japan's population contributes to a sense of resignation, as illustrated in the following representative exemplars translated from an NHK broadcast about Fukushima

An elementary school girl said, “From my research, the safety exposure limit is supposed to be 1mSv/y, but if you live here, it reaches 60mSv/y. I didn't think about it so much, but now that I know how to calculate the integral dose, I got to think its just over.

An elementary school student from Tokyo area said, “We should think all the food is contaminated. We are just left to die.

In response to an article entitled “*Child helpline of Fukushima got 5000 calls only in one month*” published a year later, in November 2012, Iori offers a positive turn of events.

Children know what is going on, and what may happen to them by their instinct. Children who have been using internet device since they were born are seemingly rebelling in Fukushima. They search on the internet and are accusing the adults of forcing the children to eat contaminated food, where they can't take any responsibility. In some schools, school staff are starting to change their policy.

Potentially motivated by a desire to minimize public perception of risk, restore a sense of normalcy, or ensure economic stability, strategies enacted by government, media, and school officials result in hindering public awareness of the need to engage in protective action. Interpreted in this light, the anger and sense of public outrage reflected in narratives represents a functional response to the emergent perception of official betrayal. Specifically, a sense of betrayal serves to moderate official messages of reassurance, and evidence confirming suspicions of deception or concealment contributes to an increased perception of danger, and the resultant fear, coupled with anger, motivates action to control danger (Bandura, 2004; Witte & Allen, 2000). Analysis of data illuminates a dawning public realization that the official emphasis on strategies designed to promote perceptions of safety implies an absence of solution efficacy (Witte & Allen, 2000). Narrative data suggests persons no longer able to rely on the benevolence of Japan's leaders eventually conclude they must act independently.

We Have to Save Ourselves

The second dimension, “we have to save ourselves” consists of three themes highlighting the Japanese public's behavioral responses to the health threats associated with the Fukushima disaster: (a) the mosquito and the dinosaur, (b) two kinds of people,

and (c) a butterfly trying to move a mountain. To maintain a temporal presentation of findings, exemplars used to illustrate themes under this dimension come from narrative content published in 2012 and 2013.

The Mosquito and the Dinosaur

This theme centers on public protest enacted in response to the Fukushima disaster. After 311, people engaged in various forms of protest, including large scale events and individual expressions of protest, with mixed results.

Participating in public demonstrations. This behavioral response becomes more meaningful in light of the rarity of public demonstrations in Japan. As Iori Mochizuki notes, “since the last Japanese revolution in the mid 19th century, Japanese have not felt the necessity of revolt.”

Multiple nuclear reactors became damaged as a result of the March 11th earthquake, and as a precautionary measure, all nuclear power plants in Japan were shut down. Possessing a better understanding of the risks associated with nuclear energy, the public became increasingly concerned by official announcements that several reactors had been inspected and would shortly be brought back online. Initially motivated by the goal of preventing the restart of 50+ nuclear reactors, people across Japan began organizing and participating in large scale public protests.

In narrative accounts published in the first half of 2011, protestors described receiving encouragement from bystanders; even police occasionally provided nonverbal signals of support. By late 2011, narratives reflected increased conflict between protestors and police, and lawyers became involved, advising protestors how to avoid

violent interactions. As time passed, narrative content revealed a widening gap in public opinion.

Be careful for the present from someone you don't know at a demonstration.
Some people were harassed to be given cat food.

- Twitter post; Mr. M

My uncle is living in Fukushima City. He says, "If we clamor against radiation effect, the whole society will be messed up. Do you understand this?" If they follow this trend, it would be "Hiroshima for anger, Nagasaki for prayer, Fukushima for silence." Considering the situation of Chernobyl, Fukushima citizens shall express more anger and anxiety.

- Mr. T

Public demonstrations increasingly symbolized a threat to maintenance of social harmony, where the act of feeding cat food to protestors becomes interpreted as a punitive reaction to a perceived violation of proscriptive cultural norms (Janoff-Bulman et al., 2009). Despite a growing sense of futility concerning the likelihood of success identified in data, large numbers of people continued to participate in mass demonstrations throughout 2012.

Countless petition, demonstration ... have been done, but none of them have been effective. ... 14,000 people demonstrated in Tokyo. However, the fact is that none of the consensus can affect the political decision. ... Contaminated food is still served at school lunch, and on the shelves of the supermarkets. There is the concrete fact that people can no longer change the situation. Japanese have been educated to think expressing your own opinion is rude. Now they are trying to learn how to speak out ... they are becoming more emotional, they are ignoring that most of protests ended up failing. Because people can't do anything for Fukushima anymore, they keep themselves distracted at alternative issues: (1) attempt to stop all the nuclear plants in Japan, (2) measuring radiation, (3) acting against the policy to spread the radioactive debris, and (4) revealing the manipulated facts about the decontamination business. The more aware people become, the harder the government becomes. Japanese society is tensioned.

- Fukushima Diary analysis

As reflected by the above exemplar, a population's willingness to engage in public protest depends on expectations concerning the likelihood of bringing about

positive change. In the absence of potential solutions for the seemingly insurmountable problems in Fukushima, people instead set goals focused on reducing potential risk. Nevertheless, because social change in Japan occurs from above (Caudill, 1973), protests produced few results, and as Iori explains, the more aware the people become, the harder the government becomes. Based on analysis of data, events frequently attracted 100,000+ participants in 2012, but with the exception of demonstrations held in conjunction with the 311 anniversary, participation declined in 2013.

This is like a mosquito and a dinosaur. One advantage of our side is being small. I believe the world would give a chance to small too.

- Iori Mochizuki, July 2013

Individual acts of protest. Large demonstrations become noticed, and if protestors annoy the dinosaur, the dinosaur can easily squash this visible annoyance. As this metaphor suggests, often the benefit of being small resides in the ability to make a difference in the world while the dinosaur remains oblivious to the mosquito's presence. Translated and reprinted in Fukushima Diary, the following exemplars illustrate the potential impact of one person's individual act of protest.

A woman in Minamisoma shi, Fukushima has been blogging about what is happening since August. She used to work for a high school, but she quit it and now opening her private tutoring school because she couldn't take telling lies. Because the content was too shocking most of the residents did not take her seriously. However, reading the articles ... Japanese readers are starting to think this is authentic.

- Introduction by Iori Mochizuki

This first excerpt comes from a translation of a live Ustream video interview between Mrs. M and an independent journalist in early January.

Q: Why do you stay in Minamisoma?

A: To prove government is killing us by using my own body. On 3/14 I thought that was already too late to evacuate, taking it into consideration that the reactors

had already exploded, and Tepco had released tons of radionuclides by venting. My place is not in the evacuating zone. Government still keeps telling us it's not dangerous, so I wanted to prove how a human becomes if they live as the government tells us to do. Everyone dies. I thought this would be my best way to burn the rest of my life. This is why I recorded details of my health problems, but honestly, it was faster than I thought.

The nature of this woman's individual act of protest is explicitly revealed by this profound declaration of purpose.¹⁴ In response to the journalist's questions, Mrs. M shares a litany of documented health problems experienced since the March 2011.

... All my fingers started feeling numb. In October, felt like something was stuck between the teeth, and 3 teeth fell off. ... After all, 4 teeth fell off. Had remaining teeth pulled off too, because they hurt too much. Lost 8 teeth in total. ... November 9, extreme fatigue. Couldn't even open the eyes. Started losing hair from November. Niece told me I was balding. Kept losing hair in December too. Felt too tired to sit on chair. Nails dropped off too. ... Husband had nosebleed in the toilet. He has hardly had nosebleed. Met old friend (42 years old). She had hair until October, but had to wear a wig in December. She and her husband both were suffering from fatigue.

Already, those listening to this interview or reading the transcript begin to recognize similarities between this woman's description and the experiences of cancer patients given intensive chemo and radiation. Iori comments, "experts" in Japan rationalize reports of such symptoms as "due to stress from radio phobia" because "women are worse at handling stress."

Following publication of this woman's experiences, Iori explains that a "self-proclaimed doctor in Minamisoma" commented, "There is no one sick in Minamisoma." In response, Mrs. M posted pictures of her teeth, mouth, and hair, along with a detailed account of her dental history. Mrs. M's willingness to reveal these intimate photos, despite the personal embarrassment she likely feels reflects the extent of her commitment to raising awareness of the risks associated with the Fukushima disaster, and contributes to the potential impact of this act of protest.

This second excerpt comes from a translation of a story shared on Mrs. M's website:

Yesterday was terrible. Feel dizzy whether I stand up or sit down. It's the same today too. I touched my hair after shower last night. A batch of my hair fell off. I was standing, but I was at a loss. I used to have long hair, but had it cut short. ... Now I wear a wig when I go out. I have least front hair now. The hairline has become very clear.

After having bath, felt something strange on my feet. Most of the nails of my feet got cracked. I couldn't trust my eyes when I tried to cut the nails. The nails of the "point fingers" of feet were almost dropping off. They slipped off when I touched them. Now the left nails are covered by the band-aid.

Japanese government declared "cold shutdown ish situation," but there is no such a definition. It's only cold shut down or not. No "ish." Typical sophistry.

As testimony to the significance of this woman's individual act of protest, Iori Mochizuki describes her website as "the most important blog in the world." Mrs. M's decision to share her experiences not only documents the human impact of this disaster, but serves to encourage others to engage in protective measures.

Two Kinds of People

This theme focuses on the two most common public responses to the Fukushima nuclear disaster identified in analysis of data. According to Iori Mochizuki, "there are two kinds of people" he describes using various dichotomous comparisons, including those who are determined to live (e.g. radiation refugees), and those who compromise (e.g. those choosing a slow death). As the following exemplar suggests, what Iori refers to as two kinds of people involves the choice of how to act in response to the Fukushima disaster.

There are two kinds of people. One is to face the social problem, [and] one is not to face the problem. The latter doesn't want to face the mortification. When they try to fix some social problem, they find themselves more powerless than they thought they were. Try so hard and get the least, they choose to go home quietly.

It was a wise choice until 4 reactors exploded in Fukushima. I was the not-to-face, but Fukushima changed the rule of the game. We used to be fed with piece of bread if we stayed obediently in the cage, but now the bread is poisonous.

Iori's characterization reflects what he describes as a dichotomous question central to the public's response: "To run or not to run, this is the question."

Radiation refugees. People who leave Japan in response to the Fukushima disaster become what Iori refers to as radiation refugees. While evacuation represents the most effective means of avoiding radiation and reducing potential health risks associated with exposure, people enacting this behavioral response encounter a range of obstacles in the process.

More people are starting to say, it's not if we should evacuate overseas, it's WHEN to evacuate. We are all human. We were not born to be cattle. When I don't allow anyone to sacrifice my life, they shall know not everyone can be corrupted by money or any kinds of threat.

After 311 most of the Japanese people got to know they were betrayed, I know. [Realizing] nobody is going to save us but ourselves, one idiot couldn't let himself down. He recalculated 100 times in his mind, but couldn't think he was wrong. He left Japan and still flying the little flag.

As the above excerpt reveals, Iori's decision to evacuate became a matter of principle. Having become physically ill, Iori made as many plans as he could before leaving Japan in late December 2011 with \$700 to his name, a single suitcase, a dash of hope, and considerable trepidation. The exemplars presented in the following pages reflect the most significant challenges he encountered along the way.

Even to me, moving is not easy. ... I felt really sick on the bus. It wasn't car sickness. I was going to tell them I would quit the company to evacuate. Exactly speaking, it was my father's company. From the day zero, it is impossible to make him understand [that] to live, I had to leave. I was having nausea as I stepped up the stairways and entered the office. He must be still at home. I picked up the receiver, twice. The third time, I managed to dialed. I thought I was going to be drowned inside of my skull. He picked it up. "Good morning, what happened?" I was, "I'll evacuate Japan, so I'll quit here." Silence. "Did you get mental?" he

replied. “No, I’m serious,” He said. “Okay, let’s talk about it later.” He hung up. I sensed the calm before the storm. My coworker came. I said, “I just said I’m gonna quit.” “Finally ...” he mumbled. My evacuation had two purposes. One is my evacuation, and one is to urge others to think about the situation. After all, I took a step. I moved forward, kicked the ground backward. That was a really heavy door. I was feeling like I wasn’t really me.

Engaging in individual behavioral responses seen by others as unnecessary, or in the above example, as “mental,” becomes perceived as aberrant due to the emphasis on consensus in Japanese culture (Caudill, 1973). The intensity of experienced emotions described in the above excerpt illuminates the degree to which cultural norms influenced public responses to the Fukushima disaster.

Yesterday was a mess. I told to my parents that I’m going to move. It was a miniature scale of Japanese society. Dad told me: “Traffic accident is more dangerous than radiation.” Mother told me: “If I quit, the company goes broke. We better die together. If we have cancer, we can kill ourselves anytime.” I said: “No, just move or kill yourself. You work to live. You don’t live to work.” I told them even if I become homeless somewhere, life is still worth living. They were like, “There is no meaning of life if you become homeless.” In short, they want me to die to support their luxury life. They even told me not to tell that I avoid radiation to my coworker because he may be scared then [and] want to move as well. This is exactly how Japan is.

This example illustrates the communal aspect and vertical structure of Japanese culture (Caudill, 1973; Dueck & Byron, 2011; Lim et al., 2011; Yamamura et al., 2003; Yamashita & Williams, 2002), where a willingness to sacrifice everything for the sake of one’s family or employer becomes expected. Analyzing the different objections to Iori’s decision, this conversation exemplifies the heterogeneity of the public’s perception of risk severity. While Iori’s father automatically minimizes the risk, his mother readily acknowledges the potential severity of risk, but prioritizes economic security over risk avoidance, illustrating the importance of material success in countries ranked high in masculinity (Yamamura et al., 2003).

“You are like cockroach or rat,” Dad said. Mom said, “Refund your education cost before you leave, or make a contract with us.” Dad clearly said, “Company is more important than his life.” I thought their sense of value is deformed. They even Googled my name in Japanese. They hit anime/porn characters with the same name as mine. They even thought I was involved in those crap seemingly. That was totally breathtaking. Sadly, I had no time to waste on their bullshit. Judging it’s nothing but a waste of time to talk, I slammed the door and left forever.

Isolation from one’s family and culture becomes a sacrifice people must consider when deciding to evacuate. Committed to his decision, Iori did not return to work. A few days later, his parents came to his apartment “to correct our misunderstandings.”

They seem to understand how much risk I recognized, though they won’t do anything for that. I hear a lot of similar cases and lots of families are facing the crisis of falling apart. At the simplest level, they are just scared of living outside of Japan. To quit my job, I’m supposed to write a letter to tell it’s my own will to quit, not the company’s. However, I’m not going to write that I will quit from my will. I’ll say I have to quit because of Tepco.

Because Iori did not anticipate the need to write a formal letter of resignation, the question of what motivated this request arises. Possibly his father made this request in the hopes that Iori would reflect on his motives for evacuating while writing the letter, and reconsider this decision. Nevertheless, Iori continued making plans to leave Japan.

Having said that I was choosing between Romania and Chile, I’ve decided to go to France. A very nice family is going to host me for 6 months, so now the problem is VISA. Also, I don’t speak French, and have no capital. I’m so nervous about it. However, I can’t sleep on my back because it makes me cough harder. It’s been like this for this month, but slowly it’s getting worse and worse. I can’t be too slow to get out of here. I went to my doctor yesterday, but my regular doctor evacuated. He was the vice president of the hospital.

One of the most significant logistical barriers to evacuation identified in data involves the VISAs required for travel. Because tourist VISAs remain valid for only three months at a time, those wishing to evacuate permanently must qualify for work VISAs, or identify countries where long term residency becomes possible. The need to earn a living

and difficulties associated with language barriers also pose significant challenges for potential evacuees.

It cost 30,000 JPY only to throw away furniture. Coughing, runny nose, fatigue, and diarrhea don't seem to get any better. I'd die if I don't move. It feels like I'm running as I'm bleeding. When I left Japan, I only had 70,000 JPY and an inexpensive laptop. How did I buy the flight ticket? That was because my host family in France raised donation for me. That was the biggest help. It cost about 2,500 USD to come to France in total. I couldn't afford it if there was no donation.

Not everyone wishing to evacuate possesses the means of doing so. Illustrating the trust that often forms between producers, sources, and consumers of alternative media (Finn & Gil de Zuniga, 2011), readers of Fukushima Diary supported Iori by providing the funds to evacuate, and welcoming him into their homes. Despite the gratitude expressed, Iori understandably experienced trepidation because in many ways the decision to leave Japan represented an act of faith.

One of the sacrifices Iori had to make before leaving involved two turtles he had kept as pets for twenty years. Because of customs restrictions, he had to find a suitable home for his companions.

Giving my pets to foster parents. Even before 311, obviously nuclear plants were the bigger risk for Japan than Kim Jong II, but none of the mass media had warned it. But I can't blame them too much because I left those turtles at my friend's place, and I didn't tell her anything. She has been raising her two daughters by herself. When I visited them, the younger girl had persistent coughing like me, and the older girl had fever. I couldn't tell them anything because otherwise they would have to evacuate too, and my turtles would be left. I'm trying to feel better by thinking this is my debt to pay in the future, and I will definitely pay one day.

To save his turtles, Iori does not encourage the friend to evacuate, despite experiencing guilt about the decision. This exemplar becomes significant in illustrating Iori's realization concerning the actions of the Japanese government and media. Just as

Iori compromised in order to save his turtles, the Japanese government, recognizing it could not permanently evacuate over 40 million citizens, compromised. While this new awareness does not appear to have lessened Iori's anger and sense of betrayal, the focus of articles published in 2012 and beyond perceptibly shifts from documenting the government's betrayal, to helping individuals and families seeking to leave Japan.

To get my health back, to escape from the anticipated fascism rising in Japan, and to reduce the size of the country by one person (=me), I left my country. My mom came to the station to see me off. Me, I was still sick. Couldn't stop coughing, still feverish, and couldn't concentrate on things, but was in the uplifting feeling. I went in the opposite direction from going home. Now that is not my home. My home is in me, so I won't need to go home forever.

Arriving in Moscow as he made his way to Western Europe, Iori notes that his sore throat is gone. A week after leaving Japan, he notes that "sore throat, coughing, pain in my left chest, runny nose, diarrhea, fatigue, headache, have been fixed."

Anyway, I was reborn. Literally I was like a new born baby. Couldn't speak French, couldn't go anywhere by myself. First of all, we decided to go to a doctor in the town. I had a nodule on my neck. He said part of my neck bitten by a bug. My ganglion may have been stimulated by it. He didn't even charge me. ... At least I'm not dead yet. I was pretty lucky to be saved by this nicest family, but if you stay in Japan any longer, the possible medical cost will be too huge to cover from your salary, whatever your job is. What's more, you can't work anymore.

In data analyzed, several people described the need for future medical care as an insurmountable barrier to evacuation. Analysis suggests that even when symptoms subside, those able to evacuate continue to experience a persistent fear of developing serious health problems in the future.

Some people think I must be missing my home, feeling lonely, depressed etc. ... At least now I can do something for the world. ... Okay, so I have proved the change of the environment solved all of the problems of my body. ... Evacuation takes a lot of sacrifice. The conclusion is that I'm okay.

Consistent with a new mission in life, Iori now acts as host to Japanese families exploring the possibility of evacuation, and has met with other Japanese radiation refugees.

I'm just back from Budapest. I met the Fukushima evacuee family and had extremely valuable talk with the mother in early 30's. Not many people have evacuated Fukushima. What made her different? This is the thing I wanted to know. The answer was very deep – we don't know.

Interestingly, instead of describing the woman's answer, Iori writes "we don't know," revealing a personal interest in understanding why some people become more likely to evacuate than others.

When 311 happened, she was in one of the most contaminated areas. Her parents, sister and friends were there. Interestingly, they are still there. She has an independent personality, but wasn't an expert of nuclear power or a biologist. She told me when she heard Yamashita said radiation doesn't come to the smiley and happy people, she understood. ... She left to the west coast of Japan with her child. On the other hand, her sister remained there with 4 and 6 years old children. The kids were hospitalized in 2011. ... Though she asks her sister why they don't evacuate, the sister replies to her, "Because nothing is dangerous, you are too paranoid to leave Fukushima." The sister's husband also says, "It's more harmful for children not to be able to play outside." ... She told me she's not in touch with her parents, sisters, and friends in Fukushima. They can't understand each other. They were given the same information after 311, but some of them realized and acted. Some didn't. ... Her child is very healthy fortunately, but the doctor diagnosed her to have thyroid nodules and cysts. The result of blood test was getting worse and worse. ... She was lucky to have found the chance to move to Europe. When she came from Japan to an airport of Europe, most of the other passengers were Japanese, but she was stopped and asked various questions, such as the purpose of visiting, length of stay, etc. This is her observation, other people might have been asked too, but she felt like it was only her. She also said she felt like it was because her passport says "from Fukushima." She didn't have a radiation test at the airport, but something made her feel like "They might be watching people coming from Fukushima." It was a scary experience for her.

Illustrating the heterogeneity of behavioral responses to the Fukushima disaster, the above exemplar highlights the within-culture variability that exists across cultures (Caudill, 1973; Morris-Suzuki, 1995). In examining narrative accounts related to

evacuation, two possible factors associated with an increased likelihood of evacuation emerged: financial means and an independent personality. As the above exemplar suggests, possessing an independent personality becomes the only explanation this mother can identify to account for why she evacuated while her sister remained in Japan. Similarly, the determination to evacuate evinced in Iori's narratives reflects a distinctly independent personality, while the support of friends compensated for a lack of financial resources. While several accounts included few details concerning individuals' personality traits, analysis suggests that an independent personality remained less essential for those possessing the financial means to evacuate as a precaution, and those with significant financial resources remained among the first to leave Japan.

Living in the land of death: A self-hypnosis model. In articles published in 2012 and beyond, Iori Mochizuki observes that more and more people in Japan appear to be giving up, resigned to "living in the land of death." In attempting to understand and explain this response to others, Iori developed a theory, the Self Hypnosis model, "to explain why Japanese people don't escape."

I was in Japan for 9 months [after 311]. I'm aware that I was irradiated too. I even had the heart pain since autumn. I recognize the fact that I might die in a few years. Dead cells of my heart will never come back alive. Maybe not, maybe yes. If I don't die, I'm just lucky. On the other hand, most of the people don't share this feeling with me. They keep trying to ignore the fact and forcing their family to take radiation risk. Why? That's what I have been thinking, and many people want to know as well. Now that everyone knows how terrible Fukushima was/is, the mysterious mentality of Japanese needs to be explained. It is not mass media or government manipulated; mass media reports what people want to see. Government manipulates all through the history. The answer is in people.

According to the self-hypnosis model, culture exists as the primary barrier to evacuation. Presented in an article published in May 2012, the significance of this model becomes apparent only in conjunction with the more detailed understanding of Japanese

cultural norms and values Iori provides in related articles. This model is presented below, followed by exemplars which serve to illuminate the experiences of those remaining in Japan. This circular model of self-hypnosis consists of four elements: bias to underestimate the radiation risk, group mind, faith in penance, and financial problem. Iori Mochizuki presents the model in two parts: (a) the elements of the model, and (b) connections among the elements.

Bias to underestimate the radiation risk. One average Japanese person would want to think Fukushima was nothing because he can't sense radiation by any means. He has not experienced a nuclear disaster either. It might affect his life in 2 years or 5 years, but at this moment, there is no problem seemingly. He has a job, house, car, family, everything. He can never imagine his life outside of Japan. He wants to think nothing's gonna change his world.

Group mind. Whether mass media affects or not, once the average Japanese goes out of his house, he meets his neighbors, other salary man on the train. Everyone lives like normal because everyone else lives like normal. If something bad is really going on, they must evacuate too. He can just follow them, like everyone else.

Faith in penance. This is a unique sense of value for Japanese. They like to torture themselves. They make an imaginary reward for the penance whatever it is and feel content to torture themselves somehow. Working until midnight even though the company is not making any profit, commuting by the busiest train, setting millions of social taboo to blame each other for breaking it, etc. You see this "faith in penance" in every generation from 5 to 100 years old. They like to imagine they are training themselves through penance so they will be rewarded for the pain. It is not based on reality. This is just their pattern of thinking. It comes out in this logic. They set an imaginary reward for the painful ceremony. It needs two elements of imaginary reward and painful ceremony.

Financial problem. House mortgage, education loan, car loan, and living expense for everyday life. This is the issue of money strongly connected to the emotion of "fear."

Connections among the elements:

From financial problem to bias to underestimate the radiation risk. Fear from financial problem provokes bias for the reality. The fear is overestimated and the reality is underestimated. It makes people see their property bigger than actual, and harder to rebuild in their new country. People are more used to worrying

about money from their everyday life, drama and movies than radiation effect, so financial fear triggers this circulation sooner than radiation risk.

From bias to underestimate risk to group mind. Now they underestimate the radiation risk but they want to justify themselves. They look for someone to do the same. If someone does not do the same, they pressure this person to do the same, to kill the fear. They end up building their virtual reality among themselves. They check each other to confirm “I’m not going wrong,” just like self-hypnosis.

From group mind to faith in penance. To make their virtual reality more concrete, they stick to their traditional custom, such as camping in the Fukushima mountains ... or going to a hot spot for school trip, etc., as if it would change the actual reality. In the logic of faith in penance, they set imaginary reward for their painful ceremony. In this case, the ceremony is to repeat their traditional custom. Imaginary reward is to remove the radiation risk by training their body to be stronger for radiation, or impressing god or heaven to clean up the contaminated world. Obsessive radiation measurement is one of these cases. Reward is to remove radiation from food imaginarily. Ceremony is to measure radiation of thousands of the items at a supermarket. The more painful it is, the more content they feel. They hold these kinds of ceremony like group enchantment.

From faith in penance to financial problem. Through the ceremony, they end up overestimating their corporation activity or school activity. By overestimating their property, they relatively underestimate the potential risk of radiation. This is how they become more blind and exclusive for the advice of outsiders to evacuate.

As the circular progression within this model suggests, people living in Japan become caught up in a vicious cycle. Fearing financial loss, individuals remain in Japan, and despite underestimating the potential risk, they almost ritualistically measure radiation in a futile effort to protect themselves from a threat they can’t see and do not fully understand. Interestingly, potentially effective protection behaviors (e.g. measuring radiation) become enacted almost ritualistically rather than as a means of avoiding highly radioactive food. The normalcy bias (Omer & Alon, 1994) can account for seeking to confirm perceptions of normalcy by observing how others behave, but a deeper understanding of the relationship between “responsibility,” self-torture, loyalty, community, and group mind in Japan becomes necessary to account for behaviors

described in the group mind and faith in penance elements of this model. As Iori explains, “To analyze this behavior of Japanese people, you need to understand what responsibility stands for in Japanese culture.”

In Japanese society, it is the highest valued not to cause any conflict. The meaning of responsibility therefore is defined in social context. It actually has nothing to do with benefit or efficiency. Trying to be responsibility is a very unique trait of Japanese.

Japanese have smooth and responsible face for others, but inside, they are in agony being tortured by themselves. Japanese mind-set is just like the one of a person with self-injurious behavior. Like a person who bites their nails, scratches their skin, pull off their hair, drinks till losing consciousness, Japanese act politely but they abuse themselves behind. It's represented anywhere. This self-injurious behavior is making Japanese people more careless for radiation and reluctant to save themselves.

The sense of responsibility and self-injurious behavior are connected to each other, and they are in proportion. The more responsibility, the more self abusive. Their sense of responsibility makes it look like betrayal to leave the society. It explains why men don't evacuate. There are numerous numbers of risks [costs] to evacuate – money, job, career, education of the children, etc. But rationally thinking, death is the worst risk. However, most of them think they don't want to evacuate. That's because they are always pressured to be “responsible.” Deceiving themselves feeling fear and ignoring radiation is their way of self-abusing. Those responsible people feel pleasure by exposing themselves to radiation. It is sometimes the sense of heroism, content feeling of hard working, self-devotion, or self-pity. The more they lose, the more pleasure they feel.

Responsibility has the very emotional meaning in Japan. Because the self-abusive attitude is in proportion with being responsible, they are even feeling pleasure to kill themselves by radiation. No matter how much you pull their hands from the outside, they won't come out anymore. Now the sense of unity, self-injurious behavior and group mind are all having synergistic effect.

As this explication suggests, because responsibility manifests in conjunction with a proportionate masochistic tendency, a social sense of responsibility encourages public inaction and acceptance of suffering rather than action informed by logic. Thus, the element “faith in penance” accounts for the public sense of resignation identified in

multiple narrative accounts. As Iori explains, the connection between “responsibility” and group mind in Japan encompasses concepts of loyalty and community.

Japan is known to be a country of cooperation. Actually Japanese tend to have strong group mind. Japanese is not scared of dying if it's with everyone, but scared of living alone. Japan is still strongly united, but it's not the connection among people, it's the connection between the government and individuals. Japanese is starting to lose the sense of community. In rural areas, it's represented as the loyalty to land inherited from ancestors; in cities, it's represented as loyalty to the job or social status. However, this is the obsessive loyalty for something, but not a strong connection among individuals.

In cities, [loyalty and responsibility] is covered with the atmosphere that you can't talk what you think. The mentality has been “read the atmosphere.” This is something called social pressure, but it doesn't lead anyone to do anything specific. It forces you not to disturb the atmosphere, which is very subjective and vague, and discourages you to express yourself. Japanese people are becoming more and more individualistic, but it's an empty individualism because they forget what they want. They are separated, empty, and lonely.

In rural areas ... the community exists only for itself. Fukushima is ground zero, and Okinawa is the last radiation haven. However, because of government policy to share radioactive debris and food, it is becoming not safe anymore. In both areas, people are forced to absolutely obey. In Fukushima, knowing it's ... harmful, people are to join community decontamination or marathon race. There is no clear punishment rule, but if they don't join it, they will feel excluded and their children are bullied in school or street. I often hear that people who managed to evacuate to Okinawa had to join the local dinner party and eat mushroom or rice from the main island of Japan. The local citizens do not have any bad intention to make the evacuating people internally exposed, they are just ignorant. However, same as in Fukushima ... if they resist they will be excluded and children will be bullied. They don't learn new things eagerly because if they study radiation risk, the absolute loyalty for the community does not allow them to do anything which may change the community. They choose to kill enlightened people to save the community. Japanese is thought to be good at team work, but actually it's only the team work under a certain rule. When they don't have a rule to follow, they restrict each other and the life of individual is unfairly underestimated.

This explication helps explain the degree of social pressure to conform reflected in the group mind element of the self-hypnosis model. Because the Japanese possess an interdependent self-construal (Markus & Kitayama, 1991), the threat of social exclusion

carries more significance in Japan than it would in societies where individuals possess an independent self-construal.

The lens provided by the self-hypnosis model supports interpretation of multiple behaviors identified in this study.

I told them I was going to evacuate with children. My husband and his parents sat to surround me and said, “We are not going to move here until you give up evacuating.” I was forced to sit square from 20:00 to 4:00 in the morning. Couldn’t even go to the toilet. It was like torture.

- Ms. A

Yesterday my husband suddenly visited us. Frighteningly he became even more selfish and arrogant. He told me I’m obsessed with nuclear issue and radiation effect, am nervous and biased. I was called insane in front of our children. Because he’s more powerful than me, children got to his side shockingly.

- Mrs. K

Using the self-hypnosis model to interpret the above exemplars, family members pressured these women to be more responsible, consistent with the group mind element of this model. Evacuating or expressing a desire to evacuate creates conflict, conveys refusal to exercise faith in penance, and challenges others’ underestimation of risk.

While multiple narratives identified in data described husbands exerting financial or social pressure to prevent wives from evacuating, analysis also identified examples of compromise.

Some of the fathers had their families evacuate Fukushima and remain in Fukushima themselves, but they don’t try to move to live with their families by excusing. Though they say they are feeling sad to live apart from their families, they don’t think of living together.

- Mr. D

Based on analysis of data, women have become the most vocal concerning risks associated with the Fukushima disaster. Iori explains that because many women stay home to care for the children, they have more time to research on the internet, while men

“are expected to devote everything to the work.” At work, talking about radiation is thought to be like talking about UFO,” while women accumulate knowledge and collect information on how to save the children. “Now, Japanese housewives are the people who are the most familiar to physics in the world.”

While women remain more likely than men to consider evacuation, protecting the wellbeing of young children remains the most significant factor motivating a desire to evacuate, although many obstacles preclude enacting this behavioral response. While people choosing to leave Japan describe feeling isolated as a consequence of evacuation, those remaining in Japan become similarly susceptible to a sense of isolation as a consequence of expressing concern about the risks associated with radiation exposure. As illustrated by the representative exemplars in this section, analysis suggests that an inability to overcome barriers encountered by those attempting to engage in protective behaviors contributes to the heterogeneous nature of enacted behavioral responses to the Fukushima disaster.

A Butterfly Trying to Move a Mountain

Iori Mochizuki responded to this disaster in two ways – by evacuating, and by creating and maintaining the Fukushima Diary website. This final theme centers on two primary goals associated with Iori’s new mission in life: (a) to create an alternative website as an antithesis to traditional media, and (b) to identify a new home for the Japanese people. Consistent with these objectives, Iori’s efforts to persuade, inform, and empower others reflect his perspective that (a) Japanese cultural norms represent a significant barrier to evacuation, and (b) by failing to empower the public, traditional media contributes to systemic domination.

Bridging the gap in media coverage. Motivated to compensate for the shortcomings of traditional media coverage and challenge the hegemonic discourse with respect to the Fukushima disaster (Hamilton & Atton, 2001; Kelly, 2011; Sandoval & Fuchs, 2010), Iori Mochizuki describes creating the Fukushima Diary website as “an antithesis to them.”

Just after 311 all the mass media lied about the plant situation and most of the Japanese people missed the chance to escape. Fukushima Diary is an antithesis of them. When I knew the reactor³ probably had a nuclear explosion, and all the mass media concealed it, I thought I had to move and do something for the truth. It wasn't a decision to need me to be courageous. It was the only way for me to go. However, there's something I must do. This is the most important thing I have. The mass media lies to you to keep you within the fence. The government would tell any kind of lies only to keep cattle (people) stay within the fence to milk until we die. The day will come when the entire world would notice they can't ignore it [this disaster] anymore. I must bridge people's attention to the day. This is the mission of Fukushima Diary.

By offering an alternative definition of the Fukushima disaster, and creating a forum for public discussion of solutions not reflected in traditional media coverage, Iori maintains the Fukushima Diary website in an attempt to empower people by countering the normative influence of mass media content (Kelly, 2011).

Even among readers, it's almost like a taboo to talk about Fukushima Diary in public. It's not only because they are thought to be “overly nervous about radiation,” but also they have a risk to be pressured by the authority. The more the health problems appear, [and] actual contamination situation is known, the more nervous they will be. I know what I'm doing. On the other hand ... Fukushima Diary is still growing. Why? Because there are almost no other sources to know Fukushima situation. It's all my responsibility. This is a fight between money and spirit. If they win, they get money. Even if I win, I get nothing. I just don't want to admit we all have [no] option. Someone said I'm idealist because I'm young. I don't think so. I think because you gave in, you are old.

Some of the “professional” journalists criticize blogger journalists. They say “it should be written like this, it shouldn't be written yet,” etc. However, they haven't stopped nuclear plants for 40 years, which means if we follow their way, we'd achieve nothing either. I don't know why they are so confident in their own “technique” or something? Fukushima is the latest nuclear catastrophe, but it's

also the first crisis that has been / will be reported by internet journalists based on SNS.

While acknowledging the limited reach of alternative media, and the frequent criticism levied by “professional” journalists, Iori also recognizes the growing importance of internet journalism. After traditional media interest in covering Fukushima increased beginning in the summer of 2013, Iori began noticing articles he wrote and published in Fukushima Diary appearing in traditional media content without citation or acknowledgment of the source of information. Consistent with Kelly’s (2011) observation that funding for investigative journalism has declined significantly over recent years, Iori responded to this plagiarism by explaining (prominently on his website) that while he understands reporters have a lot of catching up to do concerning this topic, he would appreciate being contacted before international media uses articles from his website.

Writing on a laptop at a café in Romania, Iori conveys his perspective on the potential value of alternative media using a metaphor inspired by what he sees outside the window on a cold February day in 2013.

A puppy corgi jumped into my sight. Two other stray dogs came to the puppy corgi. These two large shepherds have been living there for a long time. They have the stable supply of food by the gypsy woman. At the beginning the two were only barking, but the puppy didn’t seem to understand anything. It still tried to come to the “adult” dogs with the tail shaking, but the fretted two shepherds jumped on the puppy corgi and bit and scratched. When I got out of the shop, I couldn’t see the little corgi. Corgi type of dog won’t survive. Life is unfair. If I were one of the shepherds, I would have recruited the corgi. It was cute. It would attract young women to feed more to themselves. Also, 3 is warmer than 2 in winter season. I want to believe human is more logical than the dogs. What makes us different is the mind to share, cooperate, inspire each other and sympathize. We can hedge risks and take more chance because we all do different things with different abilities. But now the world looks like it’s becoming like the shepherds. The society without diversity will die soon. For the rest of the world, alternative media including Fukushima Diary might look like the corgi. It can be easily

lynched by major media, but it can appeal to different groups of people. With the corgi or without the corgi, which way would be more beneficial to the entire world?

As this metaphor implies, solutions to complex problems do not arise in a vacuum, and the value of alternative media lies in the exchange of diverse perspectives and areas of expertise. Consistent with the notion that traditional media wields the power to attack alternative media efforts through the use of disciplinary rhetoric (Jordan, 2007), Iori suggests that because the strong shepherds (traditional media) could not understand the potential benefit they stood to gain by welcoming the corgi (alternative media), they instinctually lashed out in aggression, but the hope expressed in this metaphor resides in the human ability to cooperate.

Bridging the cultural divide. In addition to encouraging the Japanese to evacuate, Iori has become focused on finding a new home for radiation refugees.

... Reporting is not the only mission of Fukushima Diary. The true mission is to let the Japanese alive somewhere safe.

Fukushima accident was a time altering event. What should we do in these times? It's easy to despair. ... When everyone falls into temptation to despair, it looks foolish to stand alone. It may look like Don Quixote ... However, if everyone gives up, who is supposed to inform the world? ... I think despair comes from ignorance, [but] maybe it's the desire for the truth. To grab the truth, we must open our eyes and step forward.

Nuclear was a wrong choice, but that's because we chose a wrong society to make such a mistake. It's a deep, deep problem. Just like radioactive material and reactor temperature shift, people's emotion and social state keep on changing at a real time. The world is trying to evolve. The old world is trying to stop the new one moving forward. Fukushima Diary, other kinds of whistle-blowing media, and groups are in this "hotspot" between the old world and the new world. In this rapidly changing world, people seek something universal. There's one universal thing I can serve. It's the spirit. If you want to save yourself, you must change the whole world. It's true to say its people awakening.

In reflecting on the futility of despair and encouraging the Japanese people to awaken to a new reality, Iori acknowledges the dramatic consequences of the Fukushima nuclear disaster while simultaneously describing a vision of a better future reality and the inevitable forces working against the effort to change the world we share. One of the forces acting against Iori's efforts to bring about change remains the limited reach of alternative media (Sandoval & Fuchs, 2010), which may account for why Iori characterizes his mission by explaining, "Maybe I'm a butterfly to try to move mountain, but if nobody gives their voice to out of Japan, they won't be heard."

Recognizing that fear of social and cultural isolation acts as a barrier to evacuation, Iori's recent efforts have focused on identifying a place for large numbers of Japanese to evacuate together. Researching Svalbard as one potential location because Japanese do not require a VISA to stay there, Iori codified this effort by drafting a "charter" to describe his hopes for a new Japanese community.

This [project] is not to save the country; this is to save the people. We are not in Japan; Japan is in each of us. We are not Japanese because of the geographical location of our origin and DNA of our parents. We are Japanese for our sense of value, sense of beauty, way of thinking, food, culture, and all those things to share. We had our land contaminated. We don't accept the risk of being exposed only to keep "the national body" alive for only day longer. We believe in the natural right to be happy unconditionally. Our highest priority is our healthy lives. We keep the landscape of mountains, rivers, and sea of every season in our memory, keep alive and deployed the curiosity about technology, eagerness for accepting new culture, diligence, unique and minimalist creativity. We are not to deprive anyone of anything in the world. We are just to take responsibility of our own lives independently. We live, work, and create autonomously, so we won't try to regulate each other.

Reflecting the lessons learned in the wake of the Fukushima disaster, the above "charter" identifies a number of positive Japanese traits worthy of preservation, but noticeably omits other Japanese culture norms. Interestingly, this charter reflects a

distinctly autonomous form of coexistence consistent with Hofstede's description of individualistic cultures or Markus & Kitayama's explication of an independent self-construal (Hofstede Centre, 2012; Lim et al., 2011; Markus & Kitayama, 1991; Yamamura et al., 2003).

Chapter Four

Discussion

The six themes identified in this study contribute to an understanding of the Japanese public's cognitive, affective, and behavioral responses to the Fukushima nuclear catastrophe, and in illuminating the centrality of culture and communication, narrative exemplars reveal the initial consequences of this disaster. Organized according to the questions guiding this study, discussion of the significance and theoretical relevance of findings follows.

Initial Affective and Cognitive Responses

Based on extant research, people experience a range of emotions in response to perceived danger, including fear, shock, anger, sadness, depression, anxiety, and compassion (Popova, 2012; So, 2013; Witte, 2012; Witte & Allen, 2000). Accordingly, findings suggest that the Japanese public, already experiencing dismay, anxiety, fear, and uncertainty following the earthquake, and sadness and compassion for those losing loved ones to the tsunami, did not immediately become aware of the nuclear aspect of this disaster. Results indicate that the public only gradually began to comprehend the significance of this nuclear disaster following the explosion of multiple reactors at Fukushima Daiichi.

Perceiving potential danger, individuals seek information from multiple sources (Mikami & Ikeda, 1985). Findings indicate that little information existed in the first days of the disaster, and the Japanese public experienced difficulty in interpreting the technical information obtained. When initial appraisal of threat results in cognitive uncertainty, people become increasingly motivated to engage in information-seeking behavior

(Goodall & Reed, 2013; Mikami & Ikeda, 1985; Rimal, 2001; So, 2013), although findings in the present study suggest a heterogeneous public motivation to seek information. Persons accustomed to obtaining information online actively sought additional understanding of the disaster through alternate and international media sources and participation in social media, whereas people accustomed to relying on televised or print media remained satisfied with news broadcasts and interpretations provided by traditional media in Japan. For example, while Iori Mochizuki sought information to interpret the ramifications associated with a reactor explosion, his mother remained more focused on the impact of the earthquake and tsunami.

Almost everyone living in areas of Japan undamaged by the tsunami became subject to the normalcy bias (Omer & Alon, 1994), although findings suggest the influence of the normalcy bias varied in the initial days of this disaster. Still in shock on March 12, 2011, Iori describes experiencing increased fear, anxiety, and a sense of dissonance when attempting to reconcile an impulse to flee with the beautiful spring day he observes outside the apartment window. When participating in social media conversations, however, Iori becomes surprised when discussion of the nuclear aspects of the disaster evokes ad hominem attacks seemingly intended to redirect focus from the nuclear threat to that of restoring normalcy by supporting northern Japan. In the weeks and months following the onset of disaster, the first impact of the nuclear catastrophe became a widening schism between those expressing increased anxiety over the nuclear threat, and those seeking a return to normalcy. The societal tension resulting from this polarization disrupted maintenance of harmony, representing a threat to the Japanese public's interdependent sense of self (Markus & Kitayama, 1991).

Assessing Threat and Efficacy

The extended parallel process model (EPPM) predicts that those facing potential danger first seek to assess threat severity and susceptibility (Witte & Allen, 2000). While the explosion of multiple nuclear reactors and initial reports of significant releases of radiation served as an objective indicator of high potential risk, narratives reveal a heterogeneous public perception of threat severity and susceptibility existed in the first few months of this disaster. While some individuals actively engaged in information seeking behaviors motivated by heightened anxiety concerning the potential severity of threat, results indicate that the invisibility of radiation and presence of government reassurances of safety initially contributed to widespread underestimation of risk.

As a consequence of official secrecy, people relied primarily on reports published by alternative media and on exchange of anecdotal accounts of health problems or fatalities as a means of assessing threat. For example, having assumed the responsibility for monitoring and reporting the national incidence of birth defects every year for more than a decade, Yokohama City University unexpectedly decided not to publish statistics for years beyond 2010 (Adelstein & Kyoko Stucky, 2013), creating difficulty for the Japanese public to confirm or refute the accuracy of information obtained, and fueling public suspicion concerning the motivation for such decisions.

By the summer of 2011, an increased public awareness of emergent health problems scientifically correlated with exposure to radiation contributed to perceptions of high threat severity. For example, pediatric thyroid cancer exists almost exclusively as a result of exposure to iodine-131, a short-lived radioactive isotope produced during nuclear fission and not otherwise present in the terrestrial environment (“Upsurge of

Iodine-131,” 2013; Yablokov et al., 2010). As the first form of cancer to develop following the Chernobyl disaster, pediatric thyroid cancer serves as an indicator of the potential health impact of a nuclear catastrophe (Yablokov et al., 2010). While not limited to children, this form of cancer typically takes longer to develop in adults. In the Ukraine and Belarus, confirmed cases of pediatric thyroid cancer first became identified in 1991, leading experts to hypothesize that such cancers took five years to develop following a nuclear disaster.¹⁵ This hypothesis remained unchallenged until 2012, when 27 Japanese children developed thyroid cancer (Fukushima Prefecture Health Management, 2013; “Fukushima Survey,” 2013). On November 12, 2013, Fukushima Prefecture health officials reported 58 malignant or potentially malignant cases of pediatric thyroid cancer (Mochizuki, 2013; “Seven More,” 2014), and by December 31, 2013, 75 confirmed or suspected cases became confirmed based on examination of 270,000 of 375,000 children living in Fukushima Prefecture at the time of the disaster (“8 More Fukushima Kids,” 2014; “Seven More,” 2014). By the end of 2013, thyroid nodules or cysts of varying sizes were identified in over 120,000 (44%) of Fukushima children (“Seven More,” 2014). In response to these results, the Fukushima Medical University recently announced plans to conduct a genetic analysis of cancer tissues removed from 34 of these children to identify genetic alternations associated with these cancers. Because some of the confirmed cases of thyroid cancer involved children living outside of the evacuation zone, and because these cases emerged earlier than expected based on Chernobyl research data, awareness of these cases contributed to a widespread public perception of high threat severity, susceptibility, and imminence.

A sense of betrayal. The Japanese idiom, “Me kara uroko ga ochiru” (the scales fall from one’s eyes) serves as a useful metaphor for the anger and sense of betrayal expressed in narratives following a heightened public perception of threat severity. Consistent with findings reported in research conducted by Fujigaki and Tsukahara (2011), people began questioning official statements and became skeptical, recognizing the characteristically patronizing and authoritarian government messages: “Do not overreact, do not exaggerate; trust us, we will manage it for you” (p. 389). The perception that the officials acted with disregard for the safety of citizens (Fujigaki & Tsukahara, 2011) became reinforced by the Japanese government’s media propaganda campaign, “Support by Eating,” where news anchors and even young Japanese celebrities ate Fukushima-grown food in regular televised broadcasts to encourage the public to continue eating food from Fukushima prefecture (Mochizuki, 2012). As “mothers rebuked official statements and searched for more reliable information” (Fujigaki & Tsukahara, 2011, p. 389), an increasing sense of betrayal led to further questioning of the veracity of official statements.

Findings illuminate public speculation concerning possible motives underlying perceived betrayal on the part of public officials. People described a fear of economic collapse and the impossibility of evacuating everyone living in the Tokyo metropolitan area as possible motivations for failure to adequately warn the public of the looming danger. Nevertheless, identifying plausible explanations for the perceived failure of government and media did not appear to assuage the public’s expressed anger or sense of betrayal.

A sense of betrayal cannot exist apart from a preexisting expectation that the government serves to protect the population from harm. Prior to the Fukushima disaster, the public rarely questioned the government's actions, having come to expect and depend upon the benevolence of Japan's leaders (Caudill, 1973). Thus, the expressions of betrayal identified in this study suggest that as the public awakened to the severity of the risk they faced, people concluded that the government not only failed to protect the population, but had acted against the best interests of the people all along. Because a paternalistic relationship only exists with the implicit consent of the public (Morris-Suzuki, 1995), the second consequence of this disaster became irreversible damage to the paternalistic relationship between the people and the government.

Efficacy. According to the EPPM, people shift attention to evaluation of efficacy after concluding that a threat is high (Witte & Allen, 2000). Because the source of the threat, the damaged Daiichi reactors, remained outside of the public's control, assessment of efficacy focused principally on controlling danger by reducing or avoiding risk (Bandura, 2004; Witte & Allen, 2000). Findings suggest that in the early days of the disaster, purchasing food less likely to be contaminated, buying bottled water, wearing masks outdoors, measuring radiation levels in the proximal environment, and staying out of the rain became perceived as effective in reducing danger, and people described possessing moderate to high self-efficacy with respect to enacting these measures. As time progressed, however, increasing levels of contamination in food and in the environment contributed to declining perceptions of self- and response-efficacy.

While findings indicate that the public perceived evacuation as a highly effective means of reducing or eliminating danger, most individuals described lacking the self-

efficacy necessary to enact this behavior. According to Caudill (1973) and Yamamura et al. (2003), the Japanese prioritize material success, resist change, and express strong company loyalty consistent with ranking high in masculinity and uncertainty avoidance. Because loss of material wealth, loyalty to one's employer, and fear of the unknown became identified as commonly expressed barriers to evacuation, results support these characterizations. Findings indicate that a lack of consensus among family members, the financial costs associated with relocation, VISA restrictions, language barriers, and an inability to make a living outside of Japan contributed to individuals' perception of low self-efficacy. While fear associated with high perceived threat typically motivates action (Witte & Allen, 2000), people living in Japan failed to express a universal motivation to act in response to the danger associated with this threat.

Behavioral Responses

Based on an informal survey he conducted, Iori Mochizuki suggests that people describing themselves as more individualistic than average become more likely to evacuate in response to the Fukushima disaster. Findings indicate that evacuation occurred in waves. While some individuals and families left Japan shortly after the onset of disaster, others described evacuating in stages, first moving to western Japan, and eventually leaving Japan altogether. Some parents evacuated with young children in advance of or without their spouse, while others currently living in Japan described planning to evacuate as soon as financially possible. Findings reveal that most of those intending to evacuate first engaged in careful planning and research, consistent with Japan's long-term orientation and high uncertainty avoidance (Caudill, 1973; Yamamura et al., 2003). While uncharacteristic, several families with young children evacuated

quickly and without a long-term plan, although based on narrative accounts, this initial ability to adapt as circumstances warranted often became difficult to sustain. In response to this emerging need, Iori Mochizuki has attempted to create a network of resources to sustain these families, and maintains a list of potential hosts for those seeking permanent residency in a new country.

Findings confirm that those possessing low self-efficacy with respect to evacuation eventually become resigned to remaining in Japan, and as a result, increasingly engage in a combination of denial, defensive avoidance, and reactance (Bandura, 2004; Bandura & Cervone, 1983; Muzyka, 2012; Witte & Allen, 2000) as illustrated by the “bias to underestimate the radiation risk” dimension of the self-hypnosis model developed by Iori Mochizuki. Consistent with the normalcy bias (Omer & Alon, 1994), managing fear (rather than danger) by engaging in such behaviors contributes to a person’s sense of normalcy, where observations of others behaving normally confirms and reinforces the perceived validity of this response. The importance of “killing the fear” becomes apparent in Iori’s explication of the “group mind” dimension of the self-hypnosis model, which suggests that people pressure others to similarly underestimate risk. The importance of consensus becomes illuminated by the exhortation to behave responsibly and not cause conflict by raising concerns about radiation reflected in the “faith in penance” dimension of the self-hypnosis model. Because acknowledging the severity of risk contradicts others’ ability to maintain a sense of normalcy and manage fear, the third consequence of the Fukushima disaster becomes increased tension between those seeking to persuade others of the severity of threat and those seeking to maintain a

sense of normalcy by pressuring others to act responsibly by engaging in denial, defensive avoidance, and reactance.

Impact of Disaster

In one of the earliest studies published on the Fukushima crisis, Fujigaki and Tsukahara (2011) stated that this disaster not only damaged the people, property, and economy in Japan, but “injured the human psyche and destroyed countless communities” (p. 382). Results of this study reveal how this disaster impacted the public’s physical, emotional, and spiritual wellbeing. Based on the BEIR VII report on the biological effects of ionizing radiation (National Academies Press, 2006), people in Japan face an increased risk of developing serious and chronic health problems as a result of long-term exposure to ionizing radiation, and findings confirm that this disaster has already negatively impacted the public’s health. The relationship between culture, communication, and the Japanese public’s perceptions and response to this nuclear catastrophe remains evident throughout these findings, and the self-hypnosis model Iori Mochizuki introduces further illustrates the Japanese public’s holistic worldview as described by Kim et al. (2010).

According to Seeger’s (2002) chaos theory of crisis communication, technological crises can alter public and private discourse by serving as a source of unity and positive change, or by escalating conflict or division. In many ways, the Fukushima disaster precipitated conflict and division within Japan, as evidenced by the emergent tension surrounding differing public responses to an omnipresent radiological risk.

Consistent with accounts of evacuation identified in this study, statistics released in 2012 indicate the number of Japanese citizens moving abroad more than tripled in the

year following the disaster (Wallace, 2012). In addition to what Iori refers to as the “Japanese Diaspora,” several large companies moved corporate offices or entire operations out of Japan in late 2011 or early 2012 (Rahl, 2012; Mihalascu, 2011), and findings suggest this corporate exodus accelerated in 2013. Results indicate that those who evacuated from Japan in response to the Fukushima disaster positively evaluate the overall efficacy of this behavior. Despite feeling they made the right decision, however, many individuals also describe experiencing a sense of isolation from the family, friends, and culture they left behind. Results indicate that this sense of isolation becomes particularly acute when one parent evacuates alone with the children, leaving the other parent behind in Japan. While many remaining in Japan continue to engage in risk reduction behaviors, results indicate that the Japanese public perceives little overall efficacy in eliminating risk.

Between March 12th and May 1st, the Japanese government ordered the evacuation of 380,000 people from the immediate area surrounding the Fukushima Daiichi plant, and most of these evacuees remain unable to return home (Vitazkova & Cazzoli, 2011). Many of the elderly evacuees continue to live in temporary shelters, and those lacking independent transportation often remain isolated from friends and family living elsewhere in Japan. As findings discussed earlier suggest, expressing worry about radiation often results in increased social isolation among those remaining in Japan.

Interpersonal and Online Communication

According to Finn and Gil de Zuniga (2011), a network of trust develops as a result of the online and offline communication between producers, sources, and consumers of alternative media, and findings lend support to the mutually supportive and

meaningful nature of such online collaboration. Possessing an interdependent self-construal (Markus & Kitayama, 1991), the Japanese public remains particularly vulnerable as a result of emerging tensions among friends, relatives, and community members, and those experiencing isolation often described the ability to communicate online with likeminded others helped bridge this gap. Findings suggest that as people become accustomed to interacting online with others, small “virtual” communities formed, and the distinction between interpersonal and online communication became increasingly blurred. When Iori refers to staying at a friend’s home in New York, Europe, Canada, or elsewhere, such references pertain to friendships developed online, confirming that a lack of physical proximity poses no barrier to formation or maintenance of close interpersonal relationships. Findings suggest that as the lines of communication among the Japanese public become fractured, and as the “Japanese Diaspora” continues, the formation of intercultural lines of communication facilitated by alternative media will increasingly become more interpersonal in nature.

According to Seeger (2002), social assumptions, community norms, relationships, familial and economic ties, blame-responsibility and self-similarity discourse, and the drive to return to normalcy contribute to restoration of balance in a bifurcated system. Because the normalcy bias and cultural proscriptions described in the self-hypnosis model become reflected in traditional media content, the orthodoxy of Japanese traditional media represents a force for restoration of balance consistent with pre-disaster social and cultural norms. On the other hand, findings confirm that alternative media content serves to challenge this singular view of normality by questioning what society

has failed to become in the interests of facilitating social transformation and affecting positive change (Habermas, 1992; Harcup, 2005; Sandoval & Fuchs, 2010).

Although Iori Mochizuki refers to Fukushima Diary (and by extension, other alternative media sources) as an antithesis to traditional media, alternative media does not necessarily epitomize an antithesis in the Hegelian sense because alternative media content is not limited to offering an “alternative” solution per se, but instead functions to discursively resist a return to the status quo. For example, traditional media in Japan initially either neglected to report stories concerning the Fukushima nuclear disaster, or published content conveying a strong corporate, pro-nuclear bias. In this instance, because content in Fukushima Diary reflected a clear anti-nuclear stance, this content served to raise awareness of an alternative view, serving as an antithesis to the pro-nuclear perspective reflected in Japanese traditional media, and ultimately contributed to a partial synthesis in the sense that Japanese traditional media increased reporting on issues associated with the disaster. While the extent to which alternative media influenced a subtle but perceptible shift in traditional media coverage cannot be determined, it remains unlikely that any shift would have occurred in the absence of alternative media coverage. In many instances, however, alternative media coverage does not advocate a specific (dichotomous) stance or serve as an antithesis on issues where no clear parallels exist between content published in alternative or traditional media. In essence, while alternative media content occasionally serves as an antithesis to traditional media coverage, the primary function of alternative media involves empowering an otherwise marginalized public by contesting the codes, identities, and institutionalized

social relationships depicted in the public policy pedagogy of corporate traditional media (Harcup, 2003; Kelly, 2011).

Limits

The primary limitation of this research involves a form of self-selection bias, and as a result, findings primarily reflect the perspectives of those perceiving the Fukushima disaster as a significant threat. Consequently, the views of those choosing to stay in Japan require examination of narratives written by those with a contrary perspective. Written by individuals self-identified as Japanese, the perspectives reflected in this research reveal important insights informed by those possessing intimate familiarity with Japanese culture, but because traditional media rarely includes in-depth narrative content reflecting the views of “non-experts” (Harcup, 2003), the views of those choosing to stay in Japan reflected in this study remain unverified.

While this research sheds light on the Japanese public’s initial experiences and perspectives to the Fukushima nuclear disaster, results of this study cannot account for or predict how the public responds over time. Based on research conducted on the long-term consequences of the Chernobyl disaster (Yablokov et al., 2010), the Japanese public has yet to experience the full impact of the Fukushima disaster, and as the situation in Japan inevitably worsens over the next decade, the ultimate impact of this disaster on the public’s wellbeing remains unpredictable.

The third limitation of this study involves the inability to ask follow-up questions. Many of the narratives analyzed in this research raised important topics worthy of further exploration which could not be addressed in the present research.

Conclusion

This research extends an understanding of how the Japanese public has assessed, responded to, and been impacted by the Fukushima nuclear disaster since March 11, 2011. Findings highlight the degree to which Japanese cultural norms and interpersonal communication remain central to the public's experiences and perspectives, and confirm the heuristic value of the extended parallel process model and the five cultural dimensions in Hofstede's national cultural framework. As an emergent theory, Iori Mochizuki's self-hypnosis model provided a valuable lens for furthering understanding of how this disaster impacts the Japanese public. As suggested by this research, the Japanese response to the Fukushima disaster remains highly heterogeneous. While statistics on overall releases of radiation provided by Tepco and the Japanese government provide an essential objective measure of the severity and potential impact of the Fukushima nuclear disaster, this study illuminates the value of examining detailed narrative accounts when seeking to understand the human toll of this catastrophe.

To the extent that the past remains useful in predicting the future, the emergent social and cultural tension arising in Japan as a result of this nuclear disaster becomes likely to escalate in the coming years. Research indicates that the physical health impacts associated with exposure to ionizing radiation inevitably worsen over time (National Academies Press, 2006; Yablokov et al., 2010), making the potential long-term impact of this disaster potentially overwhelming. Even if the Japanese economy remains intact and the Japanese government becomes able to regain some semblance of control over the Daiichi plant, the Japanese public emerges scarred. As a highly educated population, the growing awareness of the seemingly insurmountable challenges associated with this

nuclear catastrophe has resulted in a concomitant sense of public resignation or despondency among those remaining in the land of death.

Between 1986 and 2013, tens of thousands of studies became published on the consequences associated with the Chernobyl disaster. This disaster produced an enormous negative impact on the populations of the Ukraine and Belarus, although the evacuation of 7,500 small rural communities in the most severely contaminated areas surrounding the Chernobyl reactor lessened the overall impact of this 1986 nuclear disaster (Yablokov et al., 2010). Because the Japanese government remained unable to evacuate over 40 million people living in the Tokyo metropolitan area, the impact of the Fukushima disaster on one of the most densely populated regions in the world will become the target of extensive research in the coming years. In documenting the initial perspectives and experiences of the Japanese public, this exploratory study provides important insights and understanding for the benefit of members of the academic community involved in various efforts to support those most affected by this nuclear catastrophe.

References

- 8 more Fukushima kids found with thyroid cancer. (2014, February 7). *Jiji Press*.
Retrieved from <http://jen.jiji.com>
- 27 quadrillion becquerels of cesium-137 flowed into sea – doesn't include first week of crisis – 30 times what Tepco claimed. (2011, October 29). *Enenews*. Retrieved from <http://enenews.com>
- Aoki, M. (2013, May 9). Fukushima activist fights fear and discrimination based on radiation. *The Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- Adelstein, J., & Kyoko Stucky, N. (2013, September 26). The Fukushima generation: New data on birth defects in post-meltdown Japan. *The Daily Beast*. Retrieved from <http://www.thedailybeast.com>
- Alpeyev, P. (2011, April 13). Geiger counter unlikely to detect radiation in food, water. *Bloomberg News*. Retrieved from <http://www.bloomberg.com>
- Atomic Archive. (2013). The atomic bombings of Hiroshima and Nagasaki. Retrieved from <http://www.atomicarchive.com>
- Bandura, A. (2004). Social cognitive theory for personal and social change by enabling media. In A. Singhal, M. J. Cody, E. M. Rogers, and M. Sabido (Eds.), *Entertainment-education and social change: History, research, and practice* (pp. 75-96). Mahwah, NJ: Lawrence Erlbaum.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanism governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, 45, 1017-1028.

- Bell, A. (2003). A narrative approach to research. *Canadian Journal of Environmental Education*, 8, 95-110.
- Bensi, M. (2011, March 29). Pu contamination in soil thought to be coming from the reactors [Internal NRC email obtained May 1, 2013 through FOIA]. Retrieved from <http://www.docstoc.com/docs/155125611/FUKUSHIMA-Nuclear-Regulatory-Commission-FOIA-ML12128A322>
- Bishop of Sendai: Stop discrimination against the people of Fukushima. (2012, October 8). *Asia News*. Retrieved from <http://www.asianews.it>
- Brashers, D. E., Goldsmith, D. J., & Hsieh, E. (2002). Information seeking and avoiding in health contexts. *Human Communication Research*, 28, 258-271.
- Bridges, J. (Director), & Gilbert, B. (Executive Producer). (1979). *The China Syndrome* [Motion Picture]. US: Columbia Pictures.
- Caudill, W. (1973). The influence of social structure and culture on human behavior in modern Japan. *Ethos*, 1, 343-382. doi:10.1525/eth.1973.1.3.02a00040
- Chase, S. E. (2011). Narrative inquiry: Still a field in the making. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (pp. 421-434). Los Angeles, CA: Sage.
- City apologizes after Fukushima evacuees face discrimination. (2011, April 21). *Japan Probe*. Retrieved from <http://www.japanprobe.com>
- Coombs, W. T. (2007). Attribution theory as a guide for post-crisis communication research. *Public Relations Review*, 33, 135-139. doi:10.1016/j.pubrev.2006.11.016
- Denzin, N. K. (2001). *Interpretive interactionism*, 2nd ed. Thousand Oaks, CA: Sage.

- Dueck, A., & Byron, K. (2011). Community, spiritual traditions, and disasters in collective societies. *Journal of Psychology and Theology*, 3, 244-254.
- Ebisu, A. (Producer). (2014, January). *On Fukushima Beach 4: Pandora's Poison* [Documentary Video]. US: Ebisu Studios. Available from <http://youtube.com/user/andrewebisu/videos>
- Eisenman, D. P., Cordasco, K. M., Asch, S., Golden, J. F., & Glik, D. (2007). Disaster planning and risk communication with vulnerable communities: Lessons from Hurricane Katrina. *American Journal of Public Health*, 97, S109-S115.
doi:10.2105/AJPH.2005.084335
- Ellingson, L. L. (2009). *Engaging in crystallization in qualitative research: An introduction*. Thousand Oaks, CA: Sage.
- Ellingson, L. L. (2011). Analysis and representation across the continuum. In N. K. Denzin and Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 595-610). Thousand Oaks, CA: Sage.
- Estes, A. C. (2013, July 22). Fukushima's leaking radioactive water into the ocean after all. *Gizmodo*. Retrieved from <http://www.gizmodo.com>
- Falkheimer, J., & Heide, M. (2006). Multicultural crisis communication: Towards a social constructionist perspective. *Journal of Contingencies and Crisis Management*, 14, 180-189.
- Finn, J., & Gil de Zuniga, H. (2011, October). *Online credibility and community among blog users*. Paper presented at ASIST in New Orleans, LA.

- Fujigaki, Y., & Tsukahara, T. (2011). STS implications of Japan's 3/11 crisis. *East Asian Science, Technology and Society: An International Journal*, 5, 381-394.
doi:10.1215/18752160-1411264
- Fukushima nuclear plant: Japan takes steps over sea leak. (2013, July 23). *BBC News: Asia*. Retrieved from <http://www.bbc.co.uk/>
- Fukushima plant may have leaked huge amount of radioactive tritium. (2013, August 2). *Kyodo News*. Retrieved from <http://english.kyodonews.jp/news/2013/08/239069.html>
- Fukushima Prefecture Health Management. (2013). *The tenth report of Fukushima Prefecture health management survey* [translated by Fukushima Radioactive Contamination Systems Research]. Retrieved from <http://fukushimavoice-eng.blogspot.com/2013/02/fukushima-thyroid-examination-part-4.html>
- Fukushima survey lists 12 confirmed, 15 suspected thyroid cancer cases. (2013, June 5). *Kyodo News*. Retrieved from <http://english.kyodonews.jp/news/2013/06/228639.html>
- Fukushima: Two years after. (2013, March 14). Interview with Professor Hiroko Goto, Chiba University School of Law [News Broadcast: Special Report]. *VVH-TV*. Retrieved from <http://www.youtube.com/VVHTV?feature=watch>
- Geertz, C. (1973). Thick description: Toward an interpretive theory of culture. In C. Geertz (Ed.), *The interpretation of cultures: Selected essays* (pp. 3-30). NY: Basic Books.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.

- Godoy, J. (2013, November 27). We are suffering a slow-motion nuclear war [Interview]. *Eurasia Review*. Retrieved from <http://www.eurasiareview.com>
- Goodall, C. E., & Reed, P. (2013). Threat and efficacy uncertainty in news coverage about bed bugs as unique predictors of information seeking and avoidance: An extension of the EPPM. *Health Communication, 28*, 63-71. doi:10.1080/10410236.2012.689096
- Habermas, J. (1992). Further reflections on the public sphere. In C. Calhoun (Ed.), *Habermas and the Public Sphere*, pp. 421-61. London: MIT Press.
- Hale, J. E., Dulek, R. E., & Hale, D. P. (2005). Crisis response communication challenges: Building theory from qualitative data. *Journal of Business Communication, 42*, 112-134. doi:10.1177/0021943605274751
- Hall, J. M., & Stevens, P. E. (1991). Rigor in feminist research. *Advances in Nursing Science, 13*, 16-29.
- Hall, S. (1999). Encoding, decoding. In S. During (Ed.), *Cultural studies reader* (pp. 507-517). London: Routledge.
- Hall, S., Critcher, C., Jefferson, T., Clarke, J., & Roberts, B. (1978). *Policing the crisis: Mugging, the state, law and order*. London: Macmillan.
- Hamada, K., Tsukimori, O., Cho, M., Chung, J., Martinez, M., & Sheldrick, A. (2013, July 10). In R. Popeski (Ed.), Japan nuclear regulator alarmed at Fukushima contamination reports. *Reuters*. Retrieved from <http://www.reuters.com>
- Hamilton, J., & Atton, C. (2001). Theorizing Anglo-American alternative media: Toward a contextual history and analysis of US and UK scholarship. *Media History, 7*, 119-135. doi:10.1080/1368880012009220 0

- Harcup, T. (2003). 'The unspoken – said': The journalism of alternative media. *Journalism*, 4, 356-376. doi:10.1177/14648849030043006
- Harcup, T. (2005). "I'm doing this to change the world": Journalism in alternative and mainstream media. *Journalism Studies*, 6, 361-374. doi:10.1080/14616700500132016
- Hayashi, Y. (2013, December 7). Japan's first lady, in her own words. *Wall Street Journal: Japan*. Retrieved from <http://blogs.wsj.com/japanrealtime/2013/12/07/japans-first-lady-in-her-own-words/>
- Heath, R. L. (2006). Best practices in crisis communication: Evolution of practice through research. *Journal of Applied Communication Research*, 34, 245-248. doi:10.1080/00909880600771577
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations*. Thousand Oaks, CA: Sage.
- Hofstede Centre. (ca. 2012). *National culture: What about Japan?* Retrieved from <http://geert-hofstede.com/japan.html>
- Huntington, S. P. (1993). The clash of civilizations. *Foreign Affairs*, 72, 22-49.
- ICAN. (n.d.). *Hiroshima and Nagasaki bombings*. Retrieved from <http://www.icanw.org>
- Inajima, T., & Adelman, J. (2013, July 23). TEPCO says toxic water leaked to sea from Fukushima plant. *Bloomberg Businessweek*. Retrieved from <http://www.businessweek.com>
- Ito, T., & Maemura, T. (2013, July 31). Tepco's N-plant delays cause for worry. *The Japan News*. Retrieved from <http://www.the-japan-news.com/news/article/0000420364>

- Iwata, M., & Dvorak, P. (2013, August 6). Japan nuclear plant's battle to contain radioactive water. *Wall Street Journal*. Retrieved from <http://online.wsj.com>
- Janoff-Bulman, K., Sheikh, S., & Hepp, S. (2009). Proscriptive versus prescriptive morality: Two faces of moral regulation. *Journal of Personality and Social Psychology, 96*, 521-537. doi:10.1037/a0013779
- Japan: Radioactive water from quake-hit plant likely leaking into Pacific. (2013, July 11). *Associated Press*. Retrieved from Enenews website: <http://enenews.com>
- Jordan, J. W. (2007). Disciplining the virtual home front: Mainstream news and the web during the war in Iraq. *Communication and Critical/Cultural Studies, 4*, 276-302. doi:10.1080/14791420701459707
- Kan, N. (2013, December 12). Professional Luncheon: Naoto Kan [Video]. *The Foreign Correspondent's Club of Japan (FCCJ)*. Retrieved from FCCJ Channel at <http://www.youtube.com/>
- Karam, P. A. (2006, July 17). How do fast breeder reactors differ from regular nuclear power plants? *Scientific American*. Retrieved from <http://www.scientificamerican.com>
- Kelly, D. M. (2011). The public policy pedagogy of corporate and alternative news media. *Studies in Philosophy and Education, 30*, 185-198. doi:10.1007/s11217-011-9222-2
- Kiger, P. J. (2013, August 7). Fukushima's radioactive water leak: What you should know. *National Geographic News*. Retrieved from <http://www.news.national.geographic.com>

- Kim, J., Lim, T. S., Dindia, K., & Burrell, N. (2010). Reframing the cultural differences between the east and the west. *Communication Studies*, 61, 543-566.
doi:10.1080/10510974.2010.514675
- Kimura, S. (2013a, August 3). Mystery objects with high radiation found on Fukushima coast. *The Asahi Shimbun*. Retrieved from <http://ajw.asahi.com>
- Kimura, S. (2013b, August 10). Tepco starts pumping up contaminated water. *The Asahi Shimbun*. Retrieved from <http://ajw.asahi.com>
- Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*, 2nd ed. Thousand Oaks, CA: Sage.
- Labov, W., & Waletzky, J. (2003). Narrative analysis: Oral versions of personal experience. In C. B. Paulston & G. R. Tucker (Eds.), *Sociolinguistics: The essential readings* (ch. 5, pp. 74-104). Malden, MA: Blackwell Publishing.
(Reprinted from *Essays on the verbal and visual arts: Proceedings of the 1996 annual spring meeting of the American Ethnological Society*, pp. 12-44, by J. Helm, Ed., 1967, Seattle, WA: Washington Press).
- Leventhal, H., Leventhal, E. A., & Contrada, R. J. (1998). Self-regulation, health, and behavior: A perceptual-cognitive approach. *Psychology and Health*, 13, 717-733.
- Lim, T. S., Kim, S. Y., & Kim, J. (2011). Holism: A missing link in individualism-collectivism research. *Journal of Intercultural Communication Research*, 40, 21-38. doi:10.1080/17475759.2011.558317
- Livingston, T. (2013, December 15). *Reactor 4, not at all what you expected? Troy's edit [Video]*. Retrieved from <https://www.facebook.com/photo.php?v=10152124829483245&set=vb.619858244&type=2&heater>

- Maloney, E. K., Lapinski, M. K., & Witte, K. (2011). Fear appeals and persuasion: A review and update of the extended parallel process model. *Social and Personality Psychology Compass*, 54, 206-219. doi:10.1111/j.175.1-9004.2011.00341.x
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- McNeill, D. (2013, August 7). A Fukushima fisherman's tale: Radioactive water from the Daiichi plant is flowing into the ocean at a rate of 300 tons a day. *The Independent*. Retrieved from <http://www.independent.co.uk>
- Mie, A. (2013a, December 6). Diet enacts controversial state secrets bill. *The Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- Mie, A. (2013b, December 19). Is wife Abe's main opposition rival? *The Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- Mihalascu, D. (2011, December 7). Lexus considers moving HQ out of Japan, report says. *Inautonews*. Retrieved from <http://www.inautonews.com>
- Mikami, S., & Ikeda, K. (1985). Human response to disasters. *International Journal of Mass Emergencies and Disasters*, 3, 107-132.
- Miller, C. H., Adame, B. J., & Moore, S. D. (2013). Vested interest theory and disaster preparedness. *Disasters*, 37, 1-27. doi:10.1111/j.1467-7717.2012.01290.x
- Miroslav, G. (2011, March 22). Core melt at Fukushima Unit 1 from 11 to 12 March 2011 JST [Internal IAEA email to the Incident & Emergency Centre released through FOIA and published by Enformable on December 18, 2013]. *Enformable Nuclear News*. Retrieved from <http://www.enformable.com>

- Mizuno, N. (2013, August 9). NHK Evening News Special Report [News Broadcast]. *NHK*. Retrieved from Enenews website: <http://enenews.com>; translated video available: https://www.youtube.com/watch?v=MNqI1mmpbGk&feature=player_detailpage&t=268
- Mochizuki, I. (2012, February 28). Japan food campaign is operated by Dentsu.inc. *Fukushima Diary*. Retrieved from <http://www.fukushima-diary.com>
- Mochizuki, I. (2013, November 12). Malignant thyroid tumor of Fukushima children spiked from 43 to 58 cases. *Fukushima Diary*. Retrieved from <http://www.fukushima-diary.com>
- Morahan-Martin, J. M. (2004). How internet users find, evaluate, and use online health information: A cross-cultural review. *CyberPsychology & Behavior*, 7, 497-509.
- Morris-Suzuki, T. (1995). The invention and reinvention of “Japanese culture.” *The Journal of Asian Studies*, 54, 759-780.
- Mosk, M. (2011, March 15). Fukushima: Mark I nuclear reactor design caused GE scientist to quit in protest. *ABCNews*. Retrieved from <http://www.abcnews.com>
- Muzyka, C. N. (2012). *Perceived control over diabetes prevention in a Manitoba First Nation community* [Doctoral Dissertation, University of Manitoba]. Retrieved from <http://mspace.lib.umanitoba.ca/handle/1993/8360>
- Nagata, K., & Ito, M. (2011, May 25). Tepco admits two more meltdowns. *Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- National Academies Press. (2006). Health risks from exposure to low levels of ionizing radiation: BIER VII Phase 2. *National Research Center*. Washington, DC: National Academies Press.

- Nave, C. R. (2013). *Hyperphysics*. *George State University*. Retrieved from <http://hyperphysics.phy-astr.gsu.edu>
- Nishikawa, J. (2014, January 24). Scientists: Cosmic rays can see through nuclear reactor, locate fuel. *Asahi Shimbun*. Retrieved from <http://ajw.asahi.com>
- Nuclear expert: Xenon detections in S. Korea may be from Fukushima reactors: Criticality or ‘spontaneous fission of curium’ to blame? (2013, August 14). *Enenews*. Retrieved from <http://enenews.com>
- Ochs, E. (2011). Narrative in everyday life. In T. A. Van Dijk (Ed.), *Discourse studies: A multidisciplinary introduction* (pp. 64-84). London: Sage.
- Officials report “troubling discovery” at Fukushima nuclear plant. (2013, July 9). *Enenews*. Retrieved from <http://enenews.com>
- Okuyama, T., & Rada, T. (2013, August 1). Tepco took no action about radioactive water leak for 2 years. *The Asahi Shimbun*. Retrieved from <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308010053>
- Omer, H., & Alon, N. (1994). The continuity principle: A unified approach to disaster and trauma. *American Journal of Community Psychology*, 22, 273-287.
- Over 15 quadrillion becquerels of radioactive substances suspected in trench that Tepco now admits is leaking into groundwater at Fukushima. (2013, August 12). *Enenews*. Retrieved from <http://enenews.com>
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

- Popova, L. (2012). The extended parallel process model: Illuminating the gaps in research. *Health Education & Behavior, 39*, 455-473. doi:10.1177/1090198111418108
- Rahl, S. (2012, August 14). More Japanese firms relocating to Singapore. *The Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- Record-high 10 million bq/liter of strontium-90 & beta emitters ... 1000% more than Tepco has claimed for last 6 months. (2014, February 6). *Enenews*. Retrieved from <http://enenews.com>
- Record radiation levels detected in well at Fukushima nuke plant. (2013, December 14). *The Asahi Shimbun*. Retrieved from <http://ajw.asahi.com>
- Reporters reveal “blast” ruined inside of containment vessel at Fukushima unit 4. (2014, February 12). *Enenews*. Retrieved from <http://enenews.com>
- Reynolds, B., & Seeger, M. W. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication, 10*, 43-55. doi:10.1080/10810730590904571
- Reynolds, I., & Hirokawa, T. (2013, December 6). Japan’s Abe secures passage of secrecy law as opposition revolts. *Bloomberg Businessweek*. Retrieved from <http://www.businessweek.com>
- Riessman, C. K. (2008). *Narrative methods for the human sciences*. Thousand Oaks, CA: Sage.
- Rimal, R. N. (2001). Perceived risk and self-efficacy as motivators: Understanding individuals’ long-term use of health information. *Journal of Communication, 51*, 633-654. doi:10.1111/j.1460-2466.2001.tb02900.x

- Sandoval, M., & Fuchs, C. (2010). Towards a critical theory of alternative media. *Telematics and Informatics*, 27, 141-150.
- Seeger, M. W. (2002). Chaos and crisis: Propositions for a general theory of crisis communication. *Public Relations Review*, 28, 329-337.
- Seven more confirmed thyroid cancer cases: Total of 33 cancer in Fukushima children – preliminary results. (2014, February 7). *Fukushima Voice: Version 2e*. Retrieved from <http://fukushimavoice-eng2.blogspot.com>
- Sheldrick, A., & Slodkowski, A. (2013, August 14). Insight: After disaster, the deadliest part of Japan's nuclear clean-up. *Reuters*. Retrieved from <http://uk.reuters.com>
- So, J. (2013). A further extension of the extended parallel process model (E-EPPM): Implications of cognitive appraisal theory of emotion and dispositional coping style. *Health Communication*, 28, 72-83. doi:10.1080/10410236.2012.708633
- Stevens, P. E. (1996). Struggles with symptoms: Women's narratives of managing HIV illness. *Journal of Holistic Nursing*, 14, 142-161.
- Stevens, P. E., & Galvao, L. (2007). "He won't use condoms": HIV-infected women's struggles in primary relationships with serodiscordant partners. *American Journal of Public Health*, 97, 1015-1022.
- Suga: TEPCO must stop leak quickly. (2013, July 23). *NHK World* [News Broadcast]. No longer available online; retrieved from http://www3.nhk.or.jp/nhkworld/English/news/20130723_27.html
- Sukhoi, E. (2013, August 7). There is no way to stop Fukushima radioactive water leaking into the Pacific – expert. *The Voice of Russia*. Retrieved from Enenews website: <http://enenews.com>

- Sythe, D. (2013, July 29). The noble “pancake” radiation detector. *Geiger Counter Bulletin*. Retrieved from <http://geigercounter.com/noble-pancake-radiation-detector/>
- Tabuchi, H. (2013, July 10). Japanese nuclear plant may have been leaking for two years. *The New York Times*. Retrieved from <http://www.nytimes.com>
- Tepco corrects last summer’s water pollution data to record high. (2014, February 6). *Jiji Press*. Retrieved from <http://jen.jiji.com>
- Tepco now admits radioactive water entering the sea at Fukushima No. 1. (2013, July 22). *The Japan Times*. Retrieved from <http://www.japantimes.co.jp/>
- Tepco: Not all pumped water reached overheating Fukushima reactors. (2013, December 14). *The Asahi Shimbun*. Retrieved from <http://ajw.asahi.com>
- Tepco: Trench connected to unit no. 2 is what’s contaminating groundwater at Fukushima. (2013, August 12). *Enenews*. Retrieved from <http://enenews.com>
- Thompson, A. (2013, August 9). Fukushima power plant begins pumping contaminated water [News Broadcast]. *NBC Nightly News*. Retrieved from <http://www.nbcnews.com>
- Tokyo faced evacuation scenario: Kan. (2011, September 19). *The Japan Times*. Retrieved from <http://www.japantimes.co.jp/>
- Toxic groundwater reaching sea: NRA. (2013, July 10). *The Japan Times*. Retrieved from <http://www.japantimes.co.jp>
- Trento, J. (2012, April 9). United States circumvented laws to help Japan accumulate tons of plutonium. *National Security News Service*. Retrieved from DC Bureau website, <http://www.dcbureau.org>

- T.V.: “Extremely high levels of radioactive substances” leaked Wednesday night at Fukushima plant. (2014, February 19). *Enenews*. Retrieved from <http://enenews.com>
- T.V.: It’s a “record-high” leak at Fukushima, extraordinarily radioactive = Almost 8,000,000 times limit. (2014, February 20). *Enenews*. Retrieved from <http://enenews.com>
- T.V.: Mentally disabled are working at Fukushima Daiichi, says journalist. (2013, November 21). *Enenews*. Retrieved from <http://enenews.com>
- Tyler, L. (2005). Towards a postmodern understanding of crisis communication. *Public Relations Review*, 31, 566-571. doi:10.1016/j.pubrev.2005.08.017
- Upsurge of Iodine-131 in Japan: Daiichi on fire? (2013, July 30). *Chiba Prefecture*. Retrieved from <http://www.optimalprediction.com/wp/upsurge-of-iodine-131-in-japan-daiichi-on-fire>
- US Gov’t: Plutonium is from Fukushima reactors. (2013, October 26). *Enenews*. Retrieved from <http://enenews.com>
- Vitazkova, J., & Cazzoli, E. (2011). Estimate of consequences from the Fukushima disaster. Presented at the Nordiska Psag Grupen (NPG) Conference. Retrieved from <http://www.npsag.org>
- Wald, M. (2013, September 12). Can an ice wall fix Fukushima? [Radio Broadcast]. *KCRW: To the Point*. Retrieved from <http://www.kcrw.com>
- Wallace, R. (2012, November 21). Quake, nuke, economy fears chase Japanese overseas. *The Australian*. Retrieved from Enenews website: <http://enenews.com>

- Waymer, D., & Heath, R. L. (2007). Emergent agents: The forgotten publics in crisis communication and issues management research. *Journal of Applied Communication Research*, 35, 88-108. doi:10.1080/00909880601065730
- Willacy, M. (2013, July 23). Japanese govt criticises TEPCO's handling of Fukushima plant. *ABC News Australia*. Retrieved from <http://www.abc.net.au/pm/content/2013/s3809310.htm>
- Wingfield-Hayes, R. (2013, August 6). Fukushima radioactive water leak an 'emergency' [News Broadcast]. *BBC News Europe*. Retrieved from <http://www.bbc.co.uk/news/world-europe-23584008>
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, 59, 329-349.
- Witte, K. (2012). Introduction: Pathways. *Health Communication*, 28, 3-4. doi:10.1080/10410236.2013.743783
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, 27, 591-615. doi:10.1177/109019810002700506
- Yablokov, A. V., Nesterenko, V. B., & Nesterenko, A. V. (2010). In J. D. Sherman-Nevinger (Ed.), *Chernobyl: Consequences of the catastrophe for people and the environment*. Malden, MA: New York Academy of Sciences.
- Yamamura, J. H., Satoh, M., & Stedham, Y. (2003). Changing dimensions of national culture in Japan: Applying the Hofstede framework. *University of Nevada Reno: Economic Research Center Discussion Paper #143*, 1-37. Retrieved from <http://ir.nul.nagoya-u.ac.jp>

Yamashita, H., & Williams, C. (2002). A vote for consensus: Democracy and difference in Japan. *Comparative Education*, 38, 277-289. doi:10.1080/0305006

022000014142

Yamazaki, J. (2007). Hiroshima and Nagasaki death toll. *UCLA: Children of the Atomic Bomb*. Retrieved from <http://www.aasc.ucla.edu>

Yokota, R. M. (2013, August 7). 'No more hibakusha' takes on new meaning after 3/11. *Japan Times*. Retrieved from <http://japantimes.co.jp>

Endnotes

¹Just as the mythical Tower of Babel event served to geographically and linguistically prevent humans from collaborating en masse, the internet has made it possible to transcend the limits of linguistics and proximity, enabling a single human to communicate almost instantly with millions.

²After discovering Tepco's live streaming cameras through alternative media reports, I frequently observed this phenomenon firsthand, transfixed to my computer screen. Reminiscent of a mythical beast released from the depths of hell, the steam often turned from white/grey to a deep black in a matter of seconds, appearing less translucent as the wind formed the steam into a shape approximating a winged creature before spreading to entirely obscure the reactors from view, whereupon the plant appeared bathed in darkness, as if night had fallen at noon. Adding to the eerie visage, a small but brilliant light, sometimes blue, sometimes orange, would visibly pulsate behind this black veil of toxic steam.

³Over 400 tons of spent fuel remains in building no. 4, in a 10x12 meter pool 18 meters above ground level, covered by 7 meters of water. Spent fuel pools are located in each reactor building. In reactor building no. 3 (also showing signs of significant deterioration) the spent fuel rods stored in the pool contain greater quantities of highly dangerous isotopes because reactor no. 3 was using mixed-oxide (MOX) fuel rather than enriched uranium. There is also a common fuel pool at Fukushima Daiichi I, designated as spent fuel pool no. 7, at ground level, and this pool remains susceptible to leakage in the event of an earthquake. Each assembly is comprised of 96 15-foot rods weighing 660 pounds apiece (Sheldrick & Slodkowski, 2013). Recent controversy surrounding the location of

the reactor no. 4 core has raised the possibility that a fourth meltdown occurred at the Daiichi plant, as (a) the reactor was scheduled to go back online by 9 a.m. on March 11th, (b) evidence from extensive analysis of images released by Tepco suggests the inside of reactor no. 4 pressure vessel was severely damaged (burned), and (c) the explosion which led to the destruction of building no. 4's outer walls and ceiling occurred after building no. 3 exploded, contradicting Tepco's hypothesis that excess hydrogen gas flowed through pipes connecting buildings 3 and 4 and caused the explosion – and supporting the hypothesis that fuel in reactor vessel no. 4 overheated, and partly melted down the external north-facing wall of building no. 4 (Livingston, 2013; “Reporters reveal blast ruined,” 2014).

⁴A quadrillion is equivalent to 1,000 trillion.

⁵Figures become outdated as quickly as they are reported. Tepco continues to revise historical measurements upwards on a daily or weekly basis. Most recently, Tepco reported finding 240 billion bq. of Sr-90 and other beta emitters in 100 tons of water now leaking from an on-site storage tank, and announced that between May 2011 and August 2013, approximately 23 trillion bq. of beta emitters (11.5 trillion bq. of Sr-90) were released into the ocean (“TV: Extremely High Levels,” 2014; “TV: It's a Record-High Leak,” 2014).

⁶Perhaps as a consequence of the decline in funding for investigative journalism (Kelly, 2011) noted above.

⁷As noted in a later theme, Iori explains that in Japan, being “responsible” means not causing conflict.

⁸At times, the translator summarizes what the journalist says, rather than maintaining the journalist's first-person voice.

⁹First identified in Japan following the bombings of Hiroshima and Nagasaki, bura bura presents as extreme idiosyncratic fatigue, or "sleeping sickness."

¹⁰Following the Chernobyl disaster, the term "Chernobyl AIDS" was coined to describe an immunodeficiency disorder resulting from exposure to radiation. Because radiation destroys the thymus gland, the body can no longer produce lymphocyte T-cells, and in Japan, this condition is now referred to as Fukushima AIDS.

¹¹Anencephaly is a rare and serious birth defect in which a baby is born missing parts of the brain and skull.

¹²A serious medical condition where parts of the intestine collapses and folds into other portions of the intestine.

¹³A Japanese idiom, me kara uroko ga ochiruthose

¹⁴I have read her statement multiple times, yet these words continue to evoke an intense emotional response in me. I completely understand why Iori refers to her website as the most important blog in the world.

¹⁵In light of the rapid onset of thyroid cancer and leukemia in Japan, experts have raised questions concerning the validity of Chernobyl data, given that the U.S.S.R. is known to have concealed information for three years following the 1986 disaster.

Curriculum Vitae

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- 1992-2000 **ISACA/F (Information Systems Audit and Control Association/Foundation)**
Director of Membership and Chapter Relations (1993-2000)
Manager of Human Resources (1992-1993)
- As Director of the Membership Department; generated over 25% of Association's \$10 million+ revenue base and increased membership from 6,000 to 23,000 members in 110 countries, with chapters in over 60 countries
 - Formed over 30 new chapters in Europe, Asia and Latin America
 - Developed and led Leadership Conferences in five continents for volunteer chapter officers
 - Hired, trained and supervised department staff, and customized membership module of new database and supervised conversion process to allow for international invoicing in multiple languages and currencies
 - Wrote articles for bimonthly membership publications

PUBLICATIONS

- Allen, M., Bourhis, J., Burrell, N., Cole, A.W., Cramer, E., Dilbeck, K., England, N., Hawkins, J.M., Maier, M., Mullane, R., Omachinski, K., Omori, K., DeCloedt Pinçon, D., Victor, A., Willes, K.L., & Zmyslinski, A.N. (2013). Comparing Communication Doctoral Programs, Alumni, and Faculty: The Use of Google Scholar. *Journal of the Association for Communication Administration*, 32, 55-68.
- Ritzel, L., & Pinçon, D. (Ed.). (2011). Augment your business reality with new age web tools In K. Malik & P. K. Choudhary (Eds.), *Business organizations and collaborative web: Practices, strategies and patterns* (pp. 261-281). Hershey, PA: Information Science Reference. doi:10.4018/978-1-60960-581-0.ch016
- Pinçon, D. (2010). Flemish and non-Flemish perceptions of Flemish national identity as manifested in online news sources. *International Journal of Communication*, 4, 758-777. Available: <http://ijoc.org/ojs/index.php/ijoc>
- Peterson, J., Johnson, M., Halvorsen, B., Apmann, L., Chang, P., Kershek, S., Scherr, C., Ogi, M., & Pinçon, D. (2010). Where do nurses go for help?: A qualitative study of coping with death. *International Journal of Palliative Nursing*, 16, 432-438.
- Peterson, J. L., Johnson, M. A., Halvorsen, B., Apmann, L., Chang, P., Kershek, S., Scherr, C., Ogi, M., & Pinçon, D. (2010). What is so stressful about caring for a dying patient?: Nurses' experiences and concerns. *International Journal of Palliative Nursing*, 16, 181-187.

CONFERENCE PRESENTATIONS

- DeCloedt Pinçon, D. (2014, April). Fukushima and the Japanese Public's Communicative Response to Chronic Crisis: A Preliminary Framework. Paper accepted for presentation at the Central States Communication Association Convention, Minneapolis, MN.
- DeCloedt Pinçon, D. (2013, November). Sense Making, Self-Expression, and Counter Discourse: Applying the Functional View of Fatalistic Talk to Analysis of Parents' Autism Narratives. Paper presented at the National Communication Association Convention, Washington, DC.
- DeCloedt Pinçon, D. (2013, November). Don't Abandon Us: A Qualitative Application of the Ecological Model of Communication in Medical Interactions involving Parents of Children with Autism. Paper presented at the National Communication Association Convention, Washington, DC.
- Morey-Hawkins, J., & DeCloedt-Pinçon, D. (2012, November). New Directions for an Old Problem: Understanding the Nature and Impact of Bullying through Discourse Analysis. Top Student Paper in Peace and Conflict Division presented at the National Communication Association Convention, Orlando, FL.
- DeCloedt-Pinçon, D. (2012, July). Communication, Relational Quality, and Identity: A Holistic Understanding of Women's Sexuality over a Lifespan. Paper presented

at the International Association for Relationship Research Convention, Chicago, IL.

DeCloedt-Pinçon, D. (2012, March). Autism: A Visual Ethnography. Paper presented at the Central States Communication Association Convention, Cleveland, OH.

Pinçon, D. (2011, November). Social support across boundaries: A qualitative analysis of supportive communication behaviors in a virtual global community of practice. Paper presented at the National Communication Association Convention, New Orleans, LA.

Pinçon, D., & Kulovitz, K. (2011, November). Bad romance and the power of voice: A content analysis of unilateral and bilateral initiation of relational repair in a romantic relationships. Presented at the National Communication Association Convention, New Orleans, LA.

PROFESSIONAL, UNIVERSITY and COMMUNITY SERVICE

2013	Paper reviewer, Peace and Conflict Division, NCA
2012-2013	Mentorship Program Coordinator for Ph.D. program students
2011-2013	Chair, Department Climate Committee, Communication Graduate Student Council (CGSC)
2010	Paper reviewer, Instructional and Developmental Communication Division, International Communication Association
2009	Paper reviewer, Human Communication and Technology Division, National Communication Association
2005-2012	Poll worker in charge of voter registration, Village of Crivitz, WI
2003-Present	Digital Workforce, Cofounder/Director (volunteer capacity)

SCHOLARSHIPS, AWARDS, MEMBERSHIPS, and CERTIFICATES

Significant Scholarships

2010-2012	AOP Fellowship (\$14,000 plus tuition)
2007-2008	Florence L. Healy Women's Studies Scholarship (\$4,000)
2006-2007	Wisconsin Women in Government Scholarship (\$2,500)

Significant Academic and Professional Awards/Recognition

Top Student Paper – Peace and Conflict Division, 2012 NCA Conference
University of Wisconsin Milwaukee

- Chancellor's Award, 2010-2011 and 2007-2008
- Department of Communication Teaching Award, 2009
- Department of Communication Outstanding GPA, 2009
- Mel Miller Award for Highest GPA in Major, 2007
- Honors in the Major, Dept. of Communication, 2007

Listed in Who's Who of International Professionals, 2000 Edition

Memberships

Central States Communication Association
National Communication Association
Phi Kappa Phi Honor Society