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Imagining Sisyphus Happy: Macro-Narratives and the Politics of Fear

By

Bruce Laymon Blair

A dissertation

Submitted in partial fulfillment

of the requirements for the degree of

Doctorate of Arts in the Department of Political Science

Idaho State University

Fall 2020

To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of Bruce Laymon Blair find it satisfactory and recommend that it be accepted.

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Dedication

I dedicate this manuscript to my father, Gary E. Blair. Your personal sacrifice allowed me to seek a higher education. I just wish I could have completed this journey while you were here on this earth. I love and miss you so much.

Acknowledgements

It has taken nearly 15 years and four different graduate programs to complete my doctoral requirements. As a first generation student from a low income family, graduate school was a different planet with customs and expectations that privilege those from advanced educational and higher income backgrounds. I have been taught my whole life the blue collar ethic of pull yourself up by your boot straps and that hard work pays off. In my experience, this mentality will only get you so far in graduate school despite the outward statements that it is what matters. What matters is the building of relationships that can lead to co-authorships with faculty and students, invited talks, publication opportunities and much more. What does matter is self-promotion which is completely alien to me because I was taught that my work not my words identify my worth. What does matter is someone's biased perception of the value of your work, not the actual value of your work. This manuscript is on the impact of narratives. It is ironic that at the start of this journey, I would have never believed that narratives had any impact. It is only after 15 years of learning to become someone else that I came to understand exactly the true power of words over actions.

While I have previously discussed my struggles, I would be amiss if I did not also discuss my privileges. I have benefited based upon my race and my gender in ways that I could never explain. I write this during a time when we are collectively fighting to extend the basic right of life to all regardless of race. At no time during my extended graduate education have I ever feared for my life walking down the street or when pulled over by the police. At no time during my graduate education did I ever have to ask for

time off to attend to a condition that only my gender and/or sex experiences. At no time was I ostracized, felt uncomfortable, or excluded from important opportunities due to my race, gender, and/or sexuality. Many of my colleagues have had to endure these experiences and I am constantly amazed by their tenacity and courage. I am unsure if I would have had the fortitude to battle similar roadblocks. This may say something about myself, but it surely says something about the system of graduate education and the world we live in. A system and a world that has to change.

Given the struggles that I have gone through and the benefits and privileges that I have received over the years, there are far too many people that I need to thank and will undoubtably miss some. If I miss you, please know that it was the result of the shear amount of individuals that it took to get me to this point and not me forgetting your effort and help.

First, I would like to thank my wife. You took a chance on a shy guy with a weird accent, loads of student debt, and only unemployment and more debt in his near future. A real catch! In addition, you doubled down on your earlier decision by agreeing to move across the United States to start this doctorate journey again, for the fourth time. I can never say just how much your faith, inspiration, and continued love has helped me. Hopefully one day I can pay it back.

I would also like to thank my parents. Even though I know you did not understand my desire for a doctorate, what I would do with the degree, or even how to answer the question of what your son does for a living, you never outwardly questioned my decisions and always offered your support in any way possible. You never let me quit nor take the easy way out. This means more than any monetary resources or

personal experiences you could ever give me. I love you both with all of my heart. I miss you, old man!

To my mother-in-law, thank you very much for all of your support and love throughout the years. Thank you for agreeing to allow your daughter to move across the country away from you and never standing in-between us as we chase our dreams. Hopefully one day we can move back, but until then, please know that we both love and appreciate you so much.

To Kellee Kirkpatrick and Jim Stoutenborough, we were colleagues and you were my instructors. But most of all, you both are friends that I will forever appreciate and cherish. You invited me into your friendship circle a long time ago and you have never allowed me to leave. You recognized when I was in a profession that neither made me happy nor I was meant to be in. You gave me the opportunity and the courage to start this journey again and you provided tremendous support throughout the process to both myself and my wife. I will never be able to state exactly how much you all mean to me.

To my advisor, Donna Lybecker, at no time did you allow me or my background to stand in the way. At no time did you judge my worth based upon a biased perception of a perfect or worthy graduate student. You gave me the benefit of the doubt at all times. You allowed me to ramble on about countless topics and change my dissertation topic numerous times without judging my fit as a graduate student. You read countless proposals and writing samples. You fostered the courage to chase and secure a prestigious international fellowship. You provided key guidance and support whenever needed. For this and more, I will forever be indebted to you. Thank you very much and I can only hope to be able to model your example to future graduate students.

To my dissertation committee, thank you very much for constantly offering support and advise throughout this tedious but necessary process. This body of work would not be where it is today without your help. Once the COVID-19 pandemic is over, maybe I will be able to provide the customary snack and drinks that go with a dissertation defense. Zoom has yet to work out that part of a meeting.

I would also like to thank the Fulbright Finland Foundation, the Finnish National Agency for Education, the Department of Social Sciences and Philosophy at Jyväskylä University in Finland, and the Nuclear Energy Agency for providing funding and opportunities to expand this line of research. I would like to especially thank Tapio Litmanen for taking the chance on a random graduate student from the U.S. who emailed and asked for a support letter on short notice and a place to study for a year. You provided me the opportunity to not only expand my knowledge on nuclear waste management and Finland, but you also provided me the opportunity to grow as an individual and to form friendships that will hopefully last a life time. I will forever be indebted to you and only hope that one day I can pay your generosity forward.

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List of Abbreviations

EW	Exempt Waste
HLW	High Level Waste
IAEA	International Atomic Energy Agency
ILW	Intermediate Level Waste
INES	International Nuclear and Radiological Event Scale
LLW	Low Level Waste
NEA	Nuclear Energy Agency
NIMBY	Not in my backyard
NPF	Narrative Policy Framework
VLLW	Very Low Level Waste
VSLW	Very Short Lived Waste

Imagining Sisyphus Happy: Macro-Narratives and the Politics of Fear
Dissertation Abstract—Idaho State University (2020)

Fear is ever present and can be manipulated within the policy process by actors through the usage of macro-narratives of fear. This is the central argument of this manuscript and one that is tested by looking at high level nuclear waste management in the European Union before and after the Fukushima-Daiichi nuclear disaster. Nuclear waste management is inflicted by a dual stigma of being associated with both nuclear technologies and waste leaving it open to the impacts of risk perceptions. This manuscript argues that this dual stigmatized nature of risk can be managed through the politics of fear. The politics of fear escalates or deescalates risk perceptions related to a policy through the usage of macronarratives of fear.

After tracking macronarratives of fear over time, it was found that he politics of fear is utilized within the policy process through the usage of crises statements and biographical narratives. In addition, crises statements and biographical narratives are used to expand or contract the scope of conflict through macro-narratives of fear identified as honor, glory, and hubris statements. Next, following an external event like Fukushima-Daiichi, macro-narratives of fear will be utilized to prevent hard uncertainty and the occurrence of ontological insecurity. Lastly, after an external event, a new biographical narrative will need to be established that ensures the continuation of the reestablished ontological security by connecting a new rhetorical strategy to the self-identity of a country or group of actors.

Key words: nuclear waste management, Narrative Policy Framework, Ontological Security, Fukushima-Daiichi, science and technology

Chapter I: Introduction

The story of Sisyphus has always been a favorite of mine, maybe for sadistic if not at times all too personal reasons. Sisyphus was a character in Greek mythology condemned to an eternity of rolling a boulder uphill only to have to watch it roll back down the hill after nearly reaching the top. Sisyphus' cunningness led him to this dubious task for eternity because he tricked and handcuffed Hades and kept him prisoner in Sisyphus' closet for days. Sisyphus at first was able to dodge punishment for his crimes by cunningly persuading the Queen of the Dead, Persephone, that because he had not been afforded the proper funeral honors, he could not travel to the other side of the river Styx. Despite his cunningness and the ability to dodge punishment for his crimes, eventually the inevitable caught up to Sisyphus and he was condemned to a life time of watching the rock roll back down the hill. (Sisyphus n.d.)

The Myth of Sisyphus becomes even more interesting—again, my sadistic side—when we consider why it was created in the first place. Albert Camus, a French philosopher whose works led to the philosophic school of absurdism, wrote The Myth of Sisyphus. Within absurdism, there is a fundamental disharmony between an individual's search for meaning and the meaninglessness of the universe. Camus argued that despite the meaningless and absurdity of life, life should be taken as a challenge to be conquered and should not be tossed to the side. The rolling of the stone up the hill has purpose, even if in the end we know that it will only fall down. We must, according to Camus, revolt against the absurd and imagine Sisyphus happy if for no other purpose than to engage in the challenge of life, rolling a bolder up a hill. (Albert Camus n.d.)

There are many Sisyphean tasks within the policy arena. We generally refer to these as "wicked problems" or problems that are not definable, understandable, or consensual (Rittel and Webber 1973). Wicked problems have arisen partly due to our efficiency at solving the easier problems associated with what the general public considers undesirable, like trash in the streets, and with solutions that were easily definable, understandable, and accepted by the general public (Rittel and Webber 1973). After successfully solving the low hanging fruit of policy problems, what remained were the "wicked problems" associated with issues of equity, pluralism, and the "differentiation of values that accompanies differentiation of publics" (Rittel and Webber 1973, 156).

They may be no more of a wicked problem than that of nuclear waste management. Nuclear waste is the byproduct of almost a century of scientific advancement in the field of nuclear technology for military, energy, and medical purposes. Over the years we have improved our understanding of the best practices to safely dispose of all forms of nuclear waste, especially considering it was not too long ago that we were disposing steel barrels full of nuclear waste on the seabed, and we were directly injecting nuclear waste into fresh water aquifers. Despite increased knowledge of the best practices for nuclear waste management, we have yet been able to implement best practices for all forms of nuclear waste.

We currently have a means of safely and permanently disposing of all forms of nuclear waste according to IAEA standards, except for the most dangerous of all, high level nuclear waste. High-level nuclear waste is defined as "waste that contains such large concentrations of both short and long lived radionuclides that, compared to

intermediate level waste, a greater degree of containment and isolation from the accessible environment is needed to ensure long term safety" (IAEA 2009, 14). Most high level nuclear waste takes the form of spent fuel from nuclear reactors; has a half-life of nearly160,000 years; and at removal from the reactor, can have a temperature level above 2,800 degrees Celsius before they are placed in cooling ponds. This means that whichever waste management process is chosen, the process has to include a method of reducing the temperature of the spent nuclear fuel rods to a level that they can safely be placed in a container and a location that can safely contain the radiation for nearly 160,000 years.

The preferred method of disposal includes placing the spent nuclear rod into a cooling pond first for a time period, then placing the spent nuclear rod into a pod with specially designed cladding to that prevents radiation from leaking outside of the pod and then the pod is placed in a deep geological repository built in an area with a stable geological foundation. Currently, we process high level nuclear fuel through the first two steps but the third does not currently exist anywhere in the world leaving high level nuclear waste to stay in cooling ponds longer than normal and pods placed in temporary dry cask storage waiting for a deep geological repository to be built. Despite scientific knowledge indicating a preferred means of disposing high level nuclear waste, all attempts to build a deep geological repository to date has failed. One of the reasons for the failure is the timeframe that it takes to construct a deep geological repository, around 20 years, combined with the negative stigma associated with nuclear waste which produces the classical Not in My Backyard (NIMBY) response.

One of the defining elements of stigmatized policies like nuclear waste management, one that faces a dual stigma of being associated with nuclear technologies and one associated with waste management, is the role that fear plays in the formation of opinions and the change of fear perceptions over time. Individuals fear the impact of a deep geological repository on the continuation of their daily lives, on the value of their homes, and on their health and the health of their children. In addition, due to the uncertainty associated with any new nuclear technology like deep geological repositories, individuals fear what their support for a policy like nuclear waste management says about their self-identity (Giddens 1996). The impact of and the role of fear and self-identity has been researched over the years and applied to various policy areas, but one area that it has yet to be applied to is nuclear waste management and one of the elements of fear that has gone under researched is what I call fear based politics.

There are various theories outlining the existence of a culture of fear (i.e. Glassner 2000)—the prevalence of fear and anxiety in public discourse and relationships—and there are various theories and approaches arguing the impact of pathologies of power on policy areas like foreign policy that closely connect fear as the source of pathologies (i.e. Fettweis 2013). But connecting the usage of pathologies to control the level of fear in a society by impacting levels of uncertainty in a manner that allows a policy actor to promote their public policy is a mechanism that is under researched. This is what I call the politics of fear, the purposeful usage of fear to impact the policy process.

Chapter II: Roadmap Forward

This manuscript develops a risk based communication framework on the ability of policy narratives to impact societal level fear by examining how statements associated with self-identity impact the policy process of nuclear waste management. It does this by answering the research questions, how does the public perceive risk and nuclear waste and is risk defined and refined throughout the policy process and if so, how?

The first question is answered in large part by the literature review. Scholars have studied how the public perceives risk and nuclear waste. However, this is then expanded with a case study looking at the European Union to reveal that the public does regularly redefine risk. This then leads to examining the second research question looking at how risk is defined and redefined. In particular, this work focuses on how social amplification is used as a part of this process. As such, the key mechanism for this exploration of risk is the notion of social amplification, specifically the idea that risk can be amplified and de-amplified by media and elites through the usage of policy narratives before and after a focusing event. For this manuscript, the Fukushima-Daiichi nuclear disaster serves as the focusing event. I hypothesize:

- that in reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order (to address risk);
- that rhetorical strategies associated with the certainty of science will be used before and after a focusing event but a new rhetorical strategy will arise after the focusing event to expand the scope of conflict (redefining risk in order to account for change);

- that following an external event, macro-narratives of fear will be used to base the certainty of science rhetorical strategy within cultural norms (once again redefining risk).And, a new rhetorical strategy will be established after a focusing event.

The organization of this dissertation allows for both examining the two main research questions, and, more specifically to hypothesize and examine those hypotheses via a case study within the European Union. As such, this dissertation starts with an explanation of Terms and Definitions (Chapter 3) in order to set the stage for understanding the Literature Review (Chapter 4). The Literature Review also serves as a means to answer the first research question, how does the public perceive risk and nuclear waste? Chapters 5 and 6 follow with a Framework for examining the second research question, how is risk defined and refined throughout the policy process? Chapter 5 combines the Narrative Policy Framework with Ontological Security to develop a strategy for looking at the defining and redefining of risk for a given case study. Chapter 6 then develops a broad overview of how fear based macro-narratives are identified by addressing level of analysis, the unit of analysis, and time frames. Chapter 7 takes the frameworks and shows their application to nuclear events, setting the stage for Chapter 8 which covers the analysis of risk, fear and nuclear waste by examining a case study of the European Union. Finally, Chapter 9 presents the Discussion and Conclusions.

Chapter III: Terms and Definitions

When someone mentions the phrase “nuclear waste,” individuals instantly think back to a variety of pop cultural references that typically consist of green liquid oozing out of a barrel, or some sort of illuminated green item likely bouncing down the streets of the fictitious nuclear town of Springfield. The fact of the matter is that the aggregate term “nuclear waste”, in practice, has become nearly meaningless due to its expansiveness. Nuclear waste includes everything from low level waste, like the tools used to work on nuclear reactors and the clothing individuals wear around nuclear reactors, to high-level waste, which includes the spent rods used to power nuclear reactors. From a technical perspective, the danger and the waste management solution is solely dependent upon the type of waste. Low-level waste, for example, can be buried in shallow lined earthen pits without contaminating the surrounding area. On the other hand, if high-level waste is buried in the same manner, the entire area surrounding, above, and below the pit would be contaminated for relatively eternity. Understanding these differences is vital, however, the public typically does not make this distinction. Thus, it is necessary to outline and discuss the various kinds of nuclear waste and associated types of disposal techniques.

Nuclear Waste Classification

The following classifications are reproduced from the most recent International Atomic Energy Agency’s Classification of Radioactive Waste report (IAEA 2009). Historically, nuclear waste has been classified based upon national determinations which has led to problems related to safely managing and disposing of waste and a difficulty of sharing management knowledge beyond national borders (IAEA 2009). This led the

IAEA to establish the first international nuclear waste classification in 1970 and subsequently updated them in 1981, 1994, and most recently in 2009. The 2009 classification scheme is mainly based on long term safety considerations with the parameters being the levels of activity content of the waste and the half-lives of the radionuclides contained in the waste

Exempt Waste (EW)

Any item used in the peaceful or non-peaceful nuclear industry is classified as nuclear waste. While much of that waste contains level of radiation that prevent them from being disposed in conventional manners, some contain such low levels of radiation that it can be cleared from regulatory control and can be disposed of in conventional landfills or recycled. Waste cleared from regulatory control is called exempt waste (EW) and is treated like all other types of waste. Waste that is unable to be cleared from regulatory control is still considered nuclear waste and must then be treated based upon the level of radioactivity.

Very Short Lived Waste (VSLW)

VSLW contains waste that can be temporarily stored until the waste falls below acceptable levels of radioactivity. The time frame for decay of VSLW according to the IAEA (2009) is normally a couple of years. After decay, the waste becomes EW and is then cleared from regulatory control. Much of the VSLW waste is generated from research or medical purposes and is disposed of in decay storage.

Very Low Level Waste (VLLW)

One step above VSLW is VLLW waste. VLLW typically arises from the operation and decommissioning of nuclear facilities. Another source of VLLW are

naturally occurring radionuclides that originate from the mining or processing of ores and minerals. Disposal of VLLW is typically done in engineered surface level landfill facilities designated for VLLW, though waste rock from mining may be used, if authorized as material for purposes like roach construction.

Low Level Waste (LLW)

LLW is a broad category that contains all waste that is suitable for near surface disposal, surface level to 30m deep. This waste class contains waste just above VLLW and below intermediate level waste and does not require shielding for handling and transportation. LLW requires "robust isolation and containment for periods of up to a few hundred years" (IAEA 2009, 5) but it is hard to define LLW by decay because despite being called low level waste, LLW can contain high concentrations of short-lived radionuclides and low concentrations of long-lived radionuclides. Instead, accord to the IAEA, it is best to classify LLW as whether or not near surface disposal can be controlled for periods up to 300 years. Despite this, the IAEA is quick to note that it is impossible to define a clear line between LLW and the next level of waste, intermediate level waste. As such, LLW requires significant monitoring to insure that it is being adequately controlled.

Intermediate Level Waste (ILW)

ILW is defined as "waste that contains long lived radionuclides in quantities that need a greater degree of containment and isolation from the biosphere than is provided by near surface disposal" (IAEA 2000,: 14). ILW is recommended to be buried at a death between "a few tens and a few hundreds of meters" (IAEA 2009. 14) which is different than LLW that can buried at surface up to 30 meters deep. While the difference between

ILW and LLW cannot be clearly defined, the main difference is the need to be deposited deeper to prevent future human intrusion and the impossibility to insure 300 years of controlled access.

High Level Waste (HLW)

High level waste is defined as "waste that contains such large concentrations of both short and long lived radionuclides that, compared to ILW, a greater degree of containment and isolation from the accessible environment is needed to ensure long term safety" (IAEA 2009, 14). The preferred method of disposal is in deep geological repositories due to the long lived radionuclides and the significant amount of heat from nuclear decay. HLW consists of spent fuel from power reactors, conditioned waste arising from the reprocessing of spent fuel, and other waste whose level of activity concentration is higher than ILW requiring a significant cooling time in cooling pools before disposal.

The current definitions of nuclear waste, as indicated in this section, are based primarily on sources of nuclear waste and required means of disposal, rather than a specific activity level of radionuclides. Due to this, it is imperative to discuss the sources of nuclear waste and the different types of disposal.

Sources of Nuclear Waste

Nuclear waste comes from a variety of sources. The following classifications were all derived from and explained in the World Nuclear Association's *Storage and Disposal of Nuclear Waste* report updated in 2018.

Mining and Minerals Processing

Waste from the mining and minerals-processing of uranium or thorium ores represents the first step of the nuclear fuel cycle. Mined materials not subjected to processing constitute mine tailings and generally accumulate in piles close to mines. These tailings contain elevated levels of naturally occurring radionuclides and must be managed as nuclear waste. Mined materials subjected to processing—crushing and chemical processing—are separated into usable elements and non-usable elements in the form of mill tailings. These mill tailings contain many of the decay products, may be more susceptible to leaching and emanation, and contain significant amounts of hazardous chemicals.

Nuclear waste is also created through the extraction of phosphate minerals, mineral sands, some gold-bearing rocks, and coal and hydrocarbons. Each of these elements contains long lived radionuclides at relatively low concentrations that may exceed the level of EW. This waste is typically referred to as naturally occurring nuclear materials (NORM) or technologically enhanced naturally occurring nuclear materials (TENORM).

The majority of the waste arriving from these sources is generally VLLW but some may have an activity level high enough to be considered LLW or ILW and as such must be disposed of according to international and state level standards.

Nuclear Power Production

Nuclear power production creates a wide range of waste. One of the more commonly known sources of HLW is spent nuclear fuel. Spent nuclear fuel is fuel that has been irradiated in a nuclear reactor and is no longer useful, in its current form, for

sustaining a nuclear reaction. Due to its heat characteristics, it is usually placed in storage pools for periods up to 20 years, in an effort to cool it and to provide shielding from its radioactivity. If the spent nuclear fuel can be reprocessed in order to make it useable for the production of a nuclear reaction again, the reprocessing process generates solid, liquid, and gaseous nuclear waste. Liquid waste that has not been solidified is stored in tanks prior to its solidification. Once this waste is solidified, it turns into HLW, thus recommended storage is in deep geological repositories.

A source of ILW and LLW is created by the manufacturing of reactor fuel that "generates waste from purification, conversion and enrichment of uranium and the fabrication of fuel elements" (IAEA 2009, 14). This includes but is not limited to filter materials, trash, and residues from recycling or recovery operations. Another source of ILW and LLW is the processing of cooling water and storage pond water, from equipment decontamination and routine facility maintenance including, but not limited to, clothing, floor sweepings, paper and plastic.

Lastly, once a nuclear facility has been closed, it has to be decommissioned. This decommissioning process—outside of the waste mentioned above—produces mainly VLLW and LLW. Decommissioned items include, but are not limited to, process equipment and construction materials.

Institutional Activities

Institutional uses of nuclear materials include in research, industry, and medicine. Much of the waste is in solid form and is dealt with in fashions similar to those described above, although some are in liquid or gaseous form. One source of institutional waste is that from research reactors that produce mostly HLW. The centers that house these

research reactors or that research other elements of the nuclear energy process also produce waste not suitable for standard storage.

Due to the importance of waste storage options in defining the differences between levels of waste, it is important to define and discuss the different options. The next section is devoted to such discussion.

Nuclear Waste Storage Options and Locations

The following classifications were all derived from and explained in Peter Riley's (2004), *Nuclear Waste: Law, Policy, and Pragmatism* as well as the World Nuclear Association's *Storage and Disposal of Nuclear Waste* report updated in 2018.

Near-Surface Disposal

According to the IAEA, near-surface disposal is the disposal of waste, with or without engineered barriers, at ground level or in caverns below ground level (World Nuclear Association). The protective covering of near-surface disposal facilities is a few meters thick; the waste is placed in containers and buried in constructed vaults. When the vaults are full, it is backfilled and eventually covered and capped with an impermeable membrane and topsoil.

The World Nuclear Association (2018) argues that these facilities "will be affected by long-term climate changes (such as glaciation) and this effect must be taken into account when considering safety, as such changes could disrupt these facilities." Due to these conditions, near-surface disposal is typically used for VSLW, VLLW, and LLW. Near–surface disposal facilities are currently located in UK (LLW); Spain (LLW and ILW); France; Japan (LLW); Sweden; Finland; and in five U.S. states including New Mexico, South Carolina, Utah, Tennessee, and Washington (all LLW).

Deep Geological Disposal

One of the draw backs of near-surface disposal, as mentioned in the previous section, is that it is subjected to long term climate change effects and as such, is not recommended for HLW. For these types of waste, deep geological disposal is recommended in stable geological formations. The key process that makes deep geological disposal preferred for HLW is isolation, a condition met by a combination of engineered and natural barriers. The World Nuclear Association labels deep geological disposal a "multi-barrier concept" because waste packaging, the engineered repository, and the geology all provide barriers to prevent the radionuclides from reaching humans and the environment. Deep geological disposal is the preferred option for nuclear waste management in several countries, including but not limited to Argentina, Australia, Belgium, Canada, Czech Republic, Finland, France, Japan, the Netherlands, Republic of Korea, Russia, Spain, Sweden, Switzerland, the UK, and the US.

The most widely proposed deep geological repository is a mined repository which consists of waste packaged into canisters, cladded with some sort of cement or clay, placed in tunnels and caverns. The design of the canisters, the materials of the cladding, and the depth of the placement of the canisters is dependent upon the type of waste.

In addition to mined repositories, deep-geological repositories could also consist of deep boreholes. Deep boreholes were considered by the U.S as far back as 1957 and consists of drilling a borehole into "basement rock to a depth of up to 5000 meters, emplacing waste canisters contain used nuclear fuel or vitrified nuclear waste from reprocessing in the lower 2000 meters of the borehole, and sealing the upper 3000 meters of the borehole with materials such as bentonite, asphalt, or concrete." These boreholes

can be drilled offshore—though illegal according to international law—and onshore. Denmark, Sweden, Switzerland, and the USA have developed but not implemented deep borehole technology. One of the drawbacks of deep borehole disposal is that compared to mined repositories, deep borehole repositories are more expensive for large amounts of waste which has led countries like Sweden, Finland, and the USA to abandon any future plans.

There is currently one deep geological repository in existence, the Waste Isolation Pilot Plant (WIPP) in New Mexico. The WIPP was opened in the 1970s and is designed to bury ILW or TRU waste. There are currently no long term disposal solutions for HLW waste. HLW across the globe is currently held in interim waste storage.

Interim Waste Storage

Interim waste storage is a catch-all term for all temporary waste solutions and consists of storage ponds, dry storage, and multi-purpose canisters (MPCs). Storage ponds are located near reactors and are typically 7 – 12 meters deep. The water in the ponds is circulated and designed to both shield and to cool the fuel. The waste could be held in the pools for the life of the reactor, but once the fuel is cooled (about five years), it is typically moved to dry storage. Dry storage is currently located at most U.S. facilities and consists of waste placed into MPCs. MPCs can hold up to 89 fuel assemblies. Each container can shield up to a 45k heat load and once an assembly is placed inside an MPC, that individual assembly should never have to be touched again, just the MPC. Each MPC is enclosed in a ventilated storage module or overpack made of concrete and steel. These ventilated storage modules are commonly standing on the surface, about 6 meters high. The modules provide full shielding. If more than one

module or cask is placed together, it is called an independent spent fuel storage installation (ISFSA). About one third of the US spent rods are currently temporally placed in ISFSI.

The problem with interim waste storage lies in its name. It is interim, not permanent, and is not designed to shield nuclear waste for long periods of time. Because of that, the above ground modules are subjected to all of the problems of near-ground storage facilities plus above ground issues like weather. Some modules have been held in interim storage in the US for over 30 years presenting an ever growing problem tied to one fact; we currently do not have a long term permanent storage solution for HLW.

Chapter IV: Literature Review

Science and technology studies have made a Faustian bargain with society (Weinberg 1994, 176). Much like Gothe's Faust, science and technology studies cannot stop advancing or they will metaphorically die. This constant race to improve and advance has led science and technology to ignore what they conceive as extraneous questions, for they only slow advancement. One "extraneous" question left under-researched deals with social acceptance of scientific findings. There may be no field more obviously impacted by this Faustian bargain than nuclear technology, especially high level nuclear waste management.

This chapter attempts to examine research that does exist on the social acceptance of scientific findings concerning nuclear waste management. In doing so, it has become clear that members of the nuclear technical community typically perceive issues related to nuclear waste more optimistically than the general public (Tanaka 1996). In particular, members of the nuclear community believe they have found a safe mechanism of managing and disposing nuclear waste while the public believes that they have not (Tanaka 1996). In addition, it has been found that male scientists generally perceive lower risk from nuclear technologies than female scientists, although scientists in general perceive significantly lower levels of risk than the general public (Barke et al. 1997). Since research shows the public holds different perspectives than scientists, an important question to address is, how does the public perceive risk and nuclear waste? (research question 1).

Public Perceptions of Nuclear Waste

Nuclear power is considered by much of the public to be "unknown, uncontrollable, and dreaded" (Slovic et al. 1991b, 685), a feeling that is replicated when dealing with issues of nuclear waste (Kunreuther et al. 1988) (Slovic et al. 1991c). Though, nuclear energy is seen by some environmental groups as an acceptable technology to counter climate change (Spence et al. 2019), others still question the risk. When focusing on the risks of nuclear waste, the public fears catastrophic health, safety, and environmental effects over multiple generations (Slovic et al. 1991a). When focusing specifically on deep geological repositories, the *Europeans and Nuclear Waste* survey (European Union 1999) indicated that eight out of ten respondents listed all nuclear waste as dangerous and indicated similar risks to those listed above by Slovic (et al. 1991a). One of the more interesting findings to come out of all of the public opinion research is the perception of a stigma effect. Respondents indicated that they feared that if their area were to be the site of a nuclear waste repository, they would be subjected to the negative stigma of contamination leading to lower consumption of local agriculture products and lower tourism rates (Slovic et al. 1991c) (Avolahti and Vira 1999).

The negative perceptions of nuclear technologies as a whole has increased since the 2011 Fukushima nuclear disaster. Comparing pre- and post-Fukushima public opinions on the construction of new nuclear energy facilities in China, Sun et al. (2016) find that more Chinese citizens are worried about nuclear security issues post- Fukushima than pre- Fukushima. This led, in part, to China decommissioning a handful of nuclear plants and halting the building of other nuclear power plants (Yuan et al. 2017). Prati and Zani (2012) surveyed Italian citizens pre- and post-Fukushima and found marked

decreases in nuclear trust, environmental organization trust, and pro-nuclear attitudes. Kitada (2016) compared over thirty years of surveys conducted in Japan pre- Fukushima with a survey conducted six months after the incident. Kitada (2016) found a 70% increase in the perceived need to abolish or reduce the usage of nuclear energy post-Fukushima.

In addition to possible economic concerns of nuclear waste disposal, the general public also lacks faith in scientific evidence that suggests nuclear waste can be safely disposed in repositories without contaminating the environment (Reif and Melich 1990; 1991; 1993) (Reif and Marlier 1995). A sample of Swedish citizens and public health officials show that Swedes do not believe that a "satisfactory solution to the nuclear waste problem" has been found (Sjöberg and Drottz-Sjöberg 2008). In addition, three quarters of Europeans agreed with the following statement, "the fact that no country has yet decided to dispose of highly nuclear waste shows that there is no safe way of getting rid of this waste" (European Union 1999, 50). The questioning of the ability to protect the general public from nuclear technologies increased since the Fukushima incident (Prati and Zani 2012) (Kitada 2017). Research from Switzerland (Visschers and Siergrist 2012), Australia (Poortinga et al. 2013), and the United States (Stoutenborough et al. 2013) show similar findings. The disparity of opinions between the nuclear technical industry and the general public concerning nuclear waste repositories and the safe disposal of nuclear waste can be explained through two related mechanisms: trust and social amplification (National Research Council 2001). Both of these mechanisms relate to risk.

Trust

The opinion of the public toward any issue related to nuclear technology, including the nuclear energy industry, may be related to the secrecy of the nuclear program from its genesis (National Research Council 2001). The "defense secrecy model" has led many countries to develop nuclear technologies in a way that relegated it to a small group of technical experts and far from the eye of the general public (Kemp 1992) (Jasper 1990) (Smith 1988) preventing the public from understanding nuclear technology and instead learning their news from other sources. When governments around the world started to tackle the nuclear waste problem in the 1970s, the public had already grown to distrust nuclear technologies, thus, governments ran into unexpected outrage. Furthermore, as the National Research Council (2001, 73) argues, the language used by the nuclear waste management community did not help to build public trust. The nuclear waste community relegated all of their public interactions to "obscure jargon and abstruse questions" and engaged in bulk drops of documents, data, and technical reports in hopes of confusing the public in an effort to bypass the impacts of public opinion.

The public's general distrust of nuclear technology was echoed by the U.S. Office of Technology, when in an assessment they concluded: "The greatest single obstacle that a successful waste management program must overcome is the severe erosion of public confidence in the Federal Government that past problems have created" (Office of Technology Assessment 1982, 10). The U.S. Secretary of Energy appointed a special task force in 1991 "to recommend measures the (DOE) might take to strengthen public trust and confidence in the civilian nuclear waste program" (Secretary of Energy Advisory Board 1993, 1).

Possibly the greatest impact of trust on any issue related to nuclear technologies is that once trust is lost, it is hard to regain (Slovic 1993) (National Research Council 2001). Events during the process of building trust can reverse all efforts. Examples of this include the Three Mile Island reactor accident of 1979, the Chernobyl reactor accident of 1986, and the Fukushima reactor accident of 2011. These incidents resulted in a loss of credibility of the nuclear technology community and the science behind nuclear technologies (Poumadere 1991) (Sjöberg et al. 2000) (Prati and Zani 2012) (Sun et al. 2016) (Kitada 2016) (Sun et al. 2016). The incidents of Chernobyl, Three Mile Island, and Fukushima also indicate another mechanism that also impacts risk and that is social amplification.

Social Amplification

Social amplification is the effect of the amplification of the risks associated with an issue, like nuclear waste, due to the reporting of media or the actions of policy elites. Any event related to nuclear technologies is highly publicized, due to the history of the development of the nuclear technology industry, with less than complete information. In addition, any attempts by activists to challenge the nuclear technology community is publicized more than attempts to clarify risks of nuclear technologies like repositories. This leads to the social amplification of the risks associated with nuclear technologies because the general public is receiving a very one-sided account of nuclear technologies, one that is negative.

In other words, "social distrust is…widespread in the nuclear waste domain, is deeply seated, reflect broader trends in society, and has a continuing history of events to maintain it" (National Research Council 2001, 75). In order to more fully understand the

impact of distrust, we must first define the high level waste problem by introducing other elements that impact the policy process of high level nuclear waste repositories. In other words, "the nuclear waste management community cannot alone decide on strategies with ethical, economic, and political dimensions" (National Research Council 2001, 77). A common element within both social amplification and trust is ethics.

Ethics

Dan Dreyfus (Dreyfus 1999, p. 4), a former director of the United States High Level Waste program argued, "Social acceptance of a [nuclear waste management] strategy will ultimately depend upon comparisons among the degrees and kinds of risk to be taken and considerations of equity among current and future stakeholders. These are value judgements. They can be informed, but not decided, by science and technology." The nuclear waste management community needs informed societal judgement (NEA 1999, 23). The difficulty is that these informed societal judgements are bound in ethical decisions that are for the most part invisible to the technical community. One of the first ethical questions that arise is how to ensure intra- and inter-generational equity (National Research Council 2001).

One of the first questions with defining the high level nuclear waste problem was to define the generational scope of the problem. Should policies aimed at nuclear waste primarily take into account the current generation, future generations, or both? If accounting for future generations, how many generations should we take into account? If both, what exactly about both should we take into account and how do you balance the multiple generations? An early attempt to define the generational scope came in 1970 when the UK Royal Commission on Environmental Pollution stated "there should be no

commitment to a large programme of nuclear fission power until it has been demonstrated beyond reasonable doubt that a method exists to ensure the safe containment of long-lived nuclear waste for the indefinite future" (Flowers 1976, 202). In addition, future generations were identified as important by the Nuclear Energy Agency (1984; 1994; 1995) and have been debated endlessly (Maclean and Brown 1983) (MacLean 1986) (KASAM 1988; 1998). Common among all findings is the following belief: "those who generate the wastes should take responsibility, and provide the resources, for management of these spent fuel and nuclear waste materials in a way which will not impose undue burdens on future generations" (NEA 1995, 13). But the belief that current generations should not put undue burden upon future generations is mixed with the belief that "this generation should not foreclose options to future generations, or hinder their ability to make decisions (NEA 1999, 22).

The duality of the intergenerational equity process of "not putting undue burden upon future generations" while not taking away their agency to decide what is best for them, presents a rather difficult puzzle. One cannot do both at the same time. Anything done today takes agency away from future decisions and not doing anything today puts undue burden upon future generations. In an effort to balance these concerns, the National Research Council (2001) argues that we must first understand that we will never reach complete public acceptance of nuclear waste management decisions. Secondly, Okrent (1999) argues that we must devote resources away from gaining complete public acceptance and work on linking the issue of nuclear waste repository with other environmental and energy policies that society cares about, i.e. global climate change, in an effort to increase public acceptance of nuclear waste management decisions. Lastly,

Grunwald (2000) argues that what policy makers should care about is legitimacy of decision making. We may never agree with the distribution of equity amongst the generations, but a significant portion of the public will accept the decision as long as it is democratic and is justified via agreed upon criteria and procedures.

There exist two types of equity questions within the current generation: distributional equity and procedural equity (National Research Council 2001). Distributional equity is concerned with the question of whether "persons and communities have equal access to the benefits of the waste-generating activities" (National Research Council 2001, 78). It should be noted that by benefits, the National Research Council (2001) is including the negative as well as the positive impacts. In other words, in order for an action to qualify as distributional equity, all individuals and communities must have an equal chance of receiving the positive impacts of nuclear waste projects—i.e., increase in jobs—and also the negative impacts of nuclear waste projects—i.e., economic outcome of stigmatization of agriculture crops. Procedural equity is concerned with whether the "institutional arrangements and procedures by which policies are formulated and implemented fair(ly) to different groups" (National Research Council 2001, 78). The problem with repositories is that some areas will benefit more than others, and some will suffer more than others, specifically through the consequences—even if only perceived—of the placement of the repository. Attempts at compensating loses are often insufficient, for they typically consist of economic payments while loses are sometimes perceived as beyond economic in nature (National Research Council 2001). In addition, any attempt at reparations may exasperate current cleavages in society (Drottz-Sjöberg 1999), stresses that are lasting regardless of whether

or not the repository is located in the area (Brown et al. 1989) (Albrecht et al. 1996). The possibility of exasperating current cleavages in society is a major issue for distributional equality concerns. The stigma associated with nuclear energy is so large that even the mere consideration of a possible location may produce negative ramifications due to the belief that there must be something wrong with the area if the government and/or the local population is willing to locate a repository in the area.

The public is generally against nuclear repositories—as the previous section indicated—but research indicates that if they are brought into the decision making equation, they are more likely to have a more favorable opinion (Richardson 1998). Furthermore, what is most important is not that they are just brought into the discussion, but that ethical questions are addressed to the satisfaction of the public. Due to the nature of the beast, the sitting process of high level nuclear repositories will never meet complete distributional equity requirements, but Easterling and Kunreuther (1995) show that in situations where the public believes the decision making process was fair, they were willing to overlook distributional equity concerns. Important decision making elements to indicate procedural equity include the evaluation of more than one site and the continuing evaluation of multiple sites throughout the process. Interestingly, the sitting of Yucca Mountain in the U.S. did not follow this recommendation (Flynn et al. 1995) as well as the sitting processes in the United Kingdom and France (Kemp 1992). All three processes have been significantly slowed, stalled, or canceled.

The introduction of an intergenerational and intragenerational concern led to an increase of research into social elements of high level nuclear waste disposal. But high

level nuclear waste repository research did not stop at equity concerns. Trust, social amplification, and equity are all factors of the greater concept of risk.

Risk

The defining feature of concerns of trust and ethics is risk. Early risk-centered studies of nuclear waste management focused on the idea that risk is not what might happen sometime in the future, but what is happening today (La Porte 1977). In other words, previous generational concerns placed too much emphasis on the 1,000 year problem of high level nuclear waste disposal and not enough attention on the 10-year problem of management of a nuclear waste program (Laporte 1978). One of the first elements of management that arose was that of sitting. If geological repositories were to be built in the best geological areas and not connected to nuclear energy production by building them on the same ground as nuclear reactors, then question arose concerning what role should the public play in the sitting process (participation) and how do you convince them on the need for a repository in their backyard (trust). The scholarly work most notable for the participation and trust focus is Kraft (1991).

The U.S. government initiated a consultation and concurrence policy for the sitting of high level nuclear waste geologic repositories (IRG 1979). When it comes to repositories, a state would be consulted about the sitting of the repositories within their boundaries and the state would have to give its approval before the repository can be built. This process is problematic because it does not include a direct participation of the public in the decision making, only the governmental officials of the state. In order to increase public participation, Lee (1980) suggested that the federal government should create local sitting juries consisting of state and local interests. The National Research

Council in 1984, based upon the work of Lee (1980) and Kasperson et al. (1980) further called for a drastic increase in public participation and socio-economic research on the sitting process of geological repositories but as Solomon et al (2010) argues, that advice fell upon deaf ears. The U.S. government did not increase their socio-economic funding of repositories nor did they seek the approval of Nevada citizens when they decided to sit the Yucca Mountain Geological Repository (Solomon et al 1990). In fact, the state of Nevada funded socio-economic research and engaged the population when it came to the conclusion to oppose the Yucca Mountain sitting (Solomon et al. 1990). So the conclusion is that the public should be involved, but what processes affect public opinion?

Previous research established the need for an increase in public participation in the policy process of high level nuclear waste repositories and the need for increased socio-economic research. Yet, there was no substantial research into the individual level decision making processes of the public until the mid-1980s, when risk analysis and perception became the locus of socio-economic research on geologic repositories. One key concept that arose during this time was the notorious "Not in My Backyard" (NiMBy) response of the public. In other words, individuals are not opposed to geological repositories, they just do not want one in their backyard due to their perceptions of risk.

Looking further into this NiMBy response, Kunreuther et al (1990) found that the inability of Nevada residents to accept the sitting of the Yucca Mountain repository near them was associated mostly with their inability to accept the uncertain risks of danger to future generations. Kunreuther et al. (1990) found that the one element that influenced

the risk perceptions of Nevada residents most was their level of trust in the federal government. This lack of trust in the federal government is linked to public conceptions of fear and dread associated with the nuclear issue as a whole (Slovic et al. 1991). When controlling for possible economic benefits, Flynn and Burns et al. (1992) find that risk perceptions and public trust still accurately predicts public support while beliefs in possible economic benefits is not statistically significant.

The last series of research on risk perceptions and public trust is associated with defining the public. Flynn et al. (1993) finds that nuclear industry experts have a far lower risk perception when it comes to repositories and have a far greater trust in the federal government. Barke and Jenkins-Smith (1993) looked into risk perceptions of scientists and found that even among scientists, risk perceptions and levels of trust varied by scientific field. Jenkins-Smith and Bassett (1994) found connections between perceived risk and uncertainty. Notably, individuals with greater levels of initial uncertainty are more likely to update risk assessments. These findings suggest that overcoming NiMBy is not an easy task with risk perception tied to trust and controlled by knowledge. However, the key finding is that through specifically focused educational efforts, it is possible to overcome what Solomon et al. (2010) describes as a political stalemate when it comes to the policy process of nuclear repositories.

Attempting to Build a High Level Nuclear Waste Repository

Despite the political stalemate mentioned in the previous subsection, there are relatively few success stories when it comes to high level waste repositories. Sweden has been able to refine their sitting process to focus on four municipalities based upon higher levels of trust and a greater approval for nuclear energy on the municipal level (Sjöberg

2004) though not on the national level (Sjöberg and Drottz-Sjöberg 2009). Another country experiencing tremendous success in their process of constructing a high level nuclear waste repository is Finland who is on schedule to open their repository near Olkiluoto in 2020. The similarity between Sweden and Finland is that both repositories are being built near an existing nuclear energy plant. They differ in the fact that for Sweden, public approved of the plant—low levels of perceived risk and high governmental trust (Sjöberg 2004)—while Finland was able to lower high levels of public perceptions of risk over time (Litmanen 1996; 1999) (Lidskog and Litmanen 1997).

Finland introduced the Environmental Impact Assessment (EIA) law in 1994, which forced Posiva Oy (the Finnish nuclear waste company) to look into the environmental and social effects of any repository they plan to construct. The EIA led to an extensive public participation campaign that led to increasing interactions with local inhabitants (Kojo 2006) (Hokkanen 2004) and to increased questioning by local citizens of groups opposed to the project (Litmanen 1996) (Lidskog and Litmanen 1997) in an effort to overcome the veto ability of local municipalities. The key outcome of these discussions was not a manner of communication but instead a matter of mutual understanding (Litmanen 2008). After a time, Posiva Oy chose Olkiluoto as the location of the repository and they have been constructing the repository since then and plan to soon open the facility.

In addition to being present since 1994, the domain of social science research in Finland has evolved over time. "Early social science studies were focused mainly on monitoring, evaluating, and supporting the decision-making process for the construction

of the spent fuel disposal facility" (Litmanen 2008, 435). As such, these studies were not that important in moving public opinion from 1994 to 1996. Public participation in the EIA process at first was rather low because it concentrated only an a few individuals per municipality (Litmanen 2008). Even worse, individuals involved in the process were quoted in the news and in publications, but they rarely discussed the issues as a group, limiting the ability of coming to a common understanding (Raittila et al. 1999). Members of the media complained that they could not find any citizens to offer a contradictory opinion to that of Posiva Oy, leading to news reports on the ongoing process rather than any real discussion of the merits of a disposal repository (Raittila 2002).

The key role of social science became evident around 1998 when Posiva Oy had to submit their program to the Finnish government and the EIAs had to be updated. The key change during this period was that the actors involved in the process knew that an EIA conducted by the nuclear industry would not be accepted by the public so they hired outside representation to conduct the EIA from several interest groups, both pro and con the repository. The new EIA along with changes in nuclear energy legislation in 1994 and contradictory views of local inhabitants in potential hosting sites caused the working group of interest groups to increase funding for social science research (KTM 1996).

> "Altogether 45 studies, which could be categorized as social science, had been published by the year 1999. Most had been financed by Posiva or the JYT-programme. By 1999 Posiva had ordered studies from 17 different organizations including universities, institutions of higher education, research centres, consultants, market research and local entrepreneurial associations" (Litmanen, 2008, 439)

The main themes of these projects include but were not limited to the need for "knowledge on how to develop the nuclear waste EIA in general and to assess Posiva's EIA," how to monitor the EIA, how the media reported on nuclear waste issues, special

characteristics of possible hosting municipalities, and a summary of current social science knowledge of nuclear waste (Litmanen 2008, 439). Despite the above advances, probably the most impactful contribution of social science to the process of sitting and constructing a high level nuclear waste repository is on its ability to develop administrative practices and to construct comprehensive understanding (Litmanen 2008). It is on this last issue, the construction of comprehensive understanding that I will build upon.

One of the key issues mentioned earlier associated with risk and trust is answering the "who" question. Whose opinions of risk and trust do we need to change? In other words, who is the public? Early in the Finnish process, the public was specifically technical based or those in the nuclear industry. As Flynn et al. (1993) showed, individuals associated with the technical side of nuclear energy and waste management tend to have higher levels of trust in the federal government and lower perceptions of risk associated with nuclear technology. Thus, there was no need to invest resources into campaigns to build trust and decrease risk perceptions. When the Finnish government passed the Environmental Impact Assessment (EIA) law in 1994, they expanded the scope of the conflict to include the general public and instantly brought into play all of the issues of trust and risk associated with the "not in my backyard" perception. The Finnish government embarked on a campaign to build public trust and decrease risk perceptions. Part of that campaign was a focus on building a comprehensive understanding of nuclear waste, a task that may be equivalent to Sisyphus' efforts of pushing a boulder up a hill only to have it continue to roll back down the hill.

The question remains, how do you build a comprehensive understanding of the risks behind nuclear technologies, especially nuclear waste? Starting from the previously discussed understanding that you do not have to get every individual in a country or area to agree to the placement of a nuclear repository in order to successfully place a repository, we move away from defining the public as the general public and towards more of a understanding of the public divided into policy centric likeminded-in support or not in support-of a specific policy like nuclear waste management. The important element within this idea of coalition is what I will call group creation and stability. In order to successfully site and open a nuclear repository, a stable coalition of supporters must be created and sustained, stopping defections over a 20 (or more) year long process. In order to construct a group of like-minded individuals for policy purposes, a general policy belief has to be constructed. To prevent defection, the policy belief has to be updated to counter changes in socio-economic conditions, changes in public opinion, changes in government, and other policy decisions (Sabatier 1988). When it comes to nuclear technologies, especially nuclear waste, that general consensus is concerned with perceptions of risk.

Risk perceptions are driven primarily by social, institutional, and cultural forces tied to information processing mechanisms (Slovic 2000); especial self-identity. (Blendon et al. 2003) (Slovic 1987) (Slovic and Peters 2006). In order to build a group of like-minded individuals and to keep the group together regardless of internal and external changes, a mechanism has to be used to bind these groups together over a common self-identity perception. The mechanisms used for this paper are narrative and ontological security, perceptions that helps shape cultural forces of risk perception tied to self-

identities like fear, glory, honor, and hubris. The next section will expand upon these terms more in the formation of a general mechanism.

Conclusion

The purpose of this chapter was to provide a literature review of the general public opinion concerning nuclear waste repositories and the safe disposal of nuclear waste. In particular, this chapter laid out our current understanding of risk and risk perception as it applies to nuclear technologies including but not limited to nuclear waste management. This assessment answers the first research question, how does the public perceive risk and nuclear waste? Overall, risk is perceived differently by scientists and the general public. In general, scientists believe that the risk of nuclear technologies are lower than the general public though there is variation in risk perceptions amongst both groups. In addition, there is varying beliefs on the question of risk for whom with the distinction between risk for current generations or future and if future generations, how many generations in the future should be consider. A primary source of risk perceptions are social, institutional, and cultural factors associated with self-identities. Lastly, risk perceptions can be increased through social amplification efforts by media and policy elites and social amplification will more likely to impact risk perceptions in societies with lowered governmental trust, like following a nuclear disaster.

In order to continue the policy process, risk perceptions will need to be taken into account with special attention on how is risk defined and refined throughout the process. Special attention will need to be payed towards the interaction of self-identities and risk perception and the mechanisms that affect this relationship. The key mechanism is the notion of social amplification and the idea that risk can be amplified and de-amplified by

media and elites. The next chapter will develop a framework that lays out this social amplification and de-amplification process through the use of policy narratives and the politics of fear.

Chapter V: Framework

Researchers have spilled much ink over the years on the question of whether humans are *homo economicus* (Rodriguez-Sickert 2009), *homo sociologicus* (Fellmeth and Horwitz 2011), or *homo politicus* (Djuric 1979). In other words, in an attempt to understand the nature of humans, numerous models of human behavior have been developed including the notion that humans are utility maximizers and materialistic (*homo economicus*), group-centric and value-laden (*homo sociologicus),* and nothing more than a "political animal" (*homo politicus).* What is underrepresented in this debate until recently is the notion that humans are *homo narrans* or storytelling machines. The benefit of the *homo narrans* approach is that by assuming humans use stories to make meaning of the world around them, the other three assumptions become elements of the story instead of a single story of human action (Fisher 1995). In other words, humans can become utility maximizers and materialistic, they can become group-centric and value-laden, or they can become political animals. The key word is "become," as a narrative-centric approach allows us to understand how humans become who they are.

Narratives are spoken or written accounts that connect causal elements over time to explain an event. Narratives are neither correct nor incorrect; they are just stories. Stories that shape how individuals process information and form opinions. Narratives have heightened importance in democratic societies due to their ability to shape public opinion in a manner that creates groups of individuals that are either pro or con a specific policy. Also, narratives are crucial in a democratic society because of their ability to not only divide the public into coalitions of pro and con but their ability to also ensure coalitional stability throughout the policy process. The ability of narratives to operate

within a democratic, or any system to varying degrees, is centered on their ability to produce policy change.

There are numerous theories, frameworks, and approaches of policy change including but not limited to punctuated equilibrium (Baumgartner and Jones 1991), advocacy coalition theory (Sabateir and Jenkins-Smith 1993), multiple-streams approach (Kingdon 1984), policy diffusion (Berry and Berry 2007), social construction (Schneider and Ingram 1993), and institutional rational choice (Ostrom et al. 1994). While these approaches are influential in understanding policy change within their own confines, they do not capture the impact of narratives on policy change. In order to take into account the impact of narratives, we need to utilize the Narrative Policy Framework (i.e. McBeth et al. 2014; Shanahan et al. 2017).

Narrative Policy Framework

The Narrative Policy Framework (NPF) emerged as a framework for understanding the role of narratives on public policy and as a direct reaction to the rise in post-positive and post-materialistic understanding of the policy process (Stone 1989) (Fisher and Forrester 1993) (Roe 1994) (Hajer 1995). While this series of scholarship increased our understanding of the role of stories/narratives on public policy, they, as argued by Jones et al. (2014, 3), were primarily interpretive and rejected scientific standards of hypothesis testing. Due to their rejection of scientific standards, Jones et al. (2014) argued that they lacked the possibility of replication or generalization. The NPF is a framework centered on the role of the narrative, but is also "clear enough to be wrong" (Jones and McBeth 2010). In other words, it is built upon the scientific standards of hypothesis testing and allows for replication and generalization.

The "clear enough to be wrong" mantra (Jones and McBeth 2010) should not be interpreted as not allowing the integration of non-positivist approaches. In fact, the NPF started out in the interpretive tradition by analyzing how policy marketers sell policy to the public (McBeth and Shanahan 2004) and moved to a more positivist oriented approach due to criticism from policy scholars. Despite the move towards a more positivist oriented approach, the NPF should not be considered a methodology but instead a theoretical framework that allows for the integration of other theories and the application of positivist and non-positivist methodologies.

The main focus of the NPF is the role of policy narratives. Policy narratives are defined as any narrative that contains at least one character and some element of public policy (Shanahan et al. 2013; 457). At the core of the NPF are five assumptions. The first core assumption is that policy reality is socially constructed (Shanahan et al. 2017). A second is that "the meaning of those social constructions vary to create different policy realities, but this variation is bounded (e.g. by belief systems, ideologies, etc...) and this is not random but, rather, has some stability over time" (Shanahan et al. 2017, 179). The third assumption is that "narratives have specific and identifiable structures (Shanahan et al., 2017, 179). Fourth, "narratives operate at three interactive levels, micro (individual), meso (group), and macro (cultural and institutional) (Shanahan et al. 2017, 179). Finally, "narrative is understood to play a central role in human cognition and communication, i.e. people prefer to think and speak in story form" (Shanahan et al. 2017, 179).

The NPF contains a very detailed model of the individual. Individuals, as indicated in assumption number two, are argued to exhibit bounded rational decision making meaning individuals engage in "satisficing" decision-making instead of seeking

to maximize their expected utility from each decision. An individual instead seeks to reach a level of acceptability, a level that varies between individuals. The second component of the model of the individual for the NPF is that individuals use heuristics or information shortcuts to make complex decision making more manageable (McBeth et al. 2014) (Shanahan et al. 2017). In other words, individuals do not take into account all possible information and then make a completely well-informed decision. The third element of the individual according to the NPF is the primacy of affect or the association of negative or positive evaluations to information instead of trying to understand the world around them given all known information (McBeth et al. 2014) (Shanahan et al. 2017). Fourth, individuals engage in both parallel and serial processing at the same time (McBeth et al. 2014) (Shanahan et al. 2017). Parallel processing or system one processing, is unconscious, involuntary, and automatic thought processes associated with basic associations of something with immediate reactions. Serial processing or system two processing is more cognitive and cumbersome and involves affective cues like anger, fear, and pride. The notion of the primacy of affect with parallel and serial processing leads to the hot cognition model of the individual where an individual uses positive and negative connotations to process new information based upon preconceived notions of good or bad partly associated with the affective cues of anger, fear, pride, etc. (McBeth et al. 2014; Shanahan et al. 2017). Individuals also engage in confirmation and disconfirmation bias leading them to focus on information that confirms their preexisting beliefs and to protect their identity (McBeth et al. 2014) (Shanahan et al. 2017). The primacy of identity comes mainly from groups and networks. Last, but not least, narratives are the primary way humans make sense of the world and is the manner in

which the individuals engage in each of the previously mentioned cognitive processes (McBeth et al. 2014) (Shanahan et al. 2017).

The NPF defines a policy narrative as any narrative that contains at least one character and some element of public policy (Shanahan et al. 2013, 457). In addition, each policy narrative contains specific forms or independent variables. The various forms of a policy narrative include setting, characters, plot, and moral of the story. The *setting* of a policy narrative "consists of policy phenomena such as legal and constitutional parameters, geography, evidence, economic conditions, norms, or other features that some non-trivial amount of policy actors agree or assert are consequential within a particular policy area" (Shanahan 2017, 176). The *characters* within a policy narrative mainly take the form of victims who are harmed, villains who harm, and heroes who provide or promise relief from harm (Shanahan et al. 2017). Shanahan et al. (2017, 176) also lists possible "more nuanced" character types including beneficiaries that benefit from the actions (Weible et al. 2016), allies and opponents (Merry 2016), and entrepreneurs and charismatic experts (Lawton and Rudd 2014). The *plot* "situates the characters and their relationship in time and space…and provides the arc of action where events interact with actions of the characters and the setting, sometimes arranged in a beginning, middle, and end sequences (Shanahan et al. 2017, 176). Lastly, *the moral of the story* represents the policy solution and "gives purpose to the characters' actions and motives" (Shanahan 2017, 176).

The second narrative component is policy content. Policy is not universally similar. Each policy subject area—i.e., energy policy, environmental policy, and health policy—is different from other policy subject areas and each policy decision within

similar policy subject areas are contextually different from other policy decisions. These differentiating characteristics, referred to as policy content, includes, but is not limited to, variances in *narrative strategies* and *policy belief systems* (McBeth et al. 2014) (Shanahan et al. 2017).

Narrative strategies are actions used by policymakers to influence the policy process (Shanahan et al. 2018) and are best described according to some of the different hypotheses. The first narrative strategy is the scope of conflict. The NPF application of scope of conflict strategy is influenced by Schattschneider (1960) and focuses on the ability of policy narratives to strategically expand or contain policy issues (McBeth et al. 2010) (Shanahan et al. 2013). Schattschneider (1960) famously argued that the outcome of every conflict is determined by the extent to which the audience becomes involved in the conflict. The ability of policy actors to control the scope of conflict or the scale of political organization and the extent of political competition is deterministic in whether or not a groups policy preferences will be represented in policy decisions. It has been shown that "when actors portray themselves as losing on an issue, they engage in narratives strategies that aim to expand the scope of conflict (e.g., diffusing costs and concentrating benefits); conversely, when they portray themselves as winning, they engage in narrative strategies that contain an issue to the status quo" (Shanahan et al. 2017, 177).

The second narrative strategy is causal mechanisms which "strategically arrange narrative elements to assign responsibility and blame for a policy problem" (Shanahan et al. 2017, 178). In other words, causal mechanisms assign responsibility and blame by narrating why and how one or more factors lead to another. Stone (2002) serves as a

primary reference point for the impact of causal mechanisms on public policy. Actors can utilize causal mechanisms in a manner to influence the policy process by merely changing the characteristics that make up the mechanism.

The last narrative strategy is the devil-angel shift, based upon the work of Weible, Sabatier, and McQueen (2009). The devil shift predicts that actors will exaggerate the malicious motives, behaviors, and influence of opponents. The angel shift "occurs when groups or policy actors emphasize their ability to solve a problem and deemphasize villains" (Shanahan et al. 2017, 178).

In addition to policy narrative strategies, policy narratives also contain policy content, including but not limited to policy beliefs. Policy beliefs are a set of values or beliefs that orient individuals, groups, coalitions, and societies (Sabateir and Jenkins-Smith 1993) (Shanahan, Jones, and McBeth 2011) (Shanahan et al. 2013) (Shanahan et al. 2017). There are three sets of theories that dominate most policy belief studies of the NPF: cultural theory, human-nature relationship, and political ideology.

Policy Belief Theories

Douglas (1966) and Douglas and Wildavsky (1982) developed Cultural Theory as a way to understand how and why individuals form judgments about danger, pollution, and threat as a condition of social context. Douglas (1966) and Douglas and Wildavsky (1982) argue that social debates about risks cannot be reduced to concerns about safety and instead argue that they are inseparable from issues relating to power, justice, and legitimacy. Cultural Theory also provides normative guidelines that emphasize the importance of the processes by which decisions regarding risks are made. Cultural Theory, overall, suggests that "the views of any particular individual on matters are

shaped by the nature of social groups of which they are a part, i.e., various organizations, peer group influence or other sources of authority, and by the degree to which individuals feel bonded to larger social groups" (Tansey and O'Riordan 1999, 71). Thusly, "attitude and judgment about risks and the pattern of social justice and responsible government are set in cultural relationships, namely the expectations and value systems of people belonging to the distinctive groups" (Tansey and O'Riordan 1999, 71). Cultural theory measures belief systems of individuals along four dimensions: fatalist, hierarchy, individualism, and egalitarian (Wildavsky and Dake 1990).

The human-nature relationship is partially represented by the debates of John Muir and Gifford Pinchot. Pinchot's narrative on the human-nature relationship is best described as conservation or the idea that public land should be used by both the public for recreation and by businesses for profit as long as the use is sustainable (Oravec 1984). On the other hand, Muir's narrative of the optimal human-nature relationship is best described as preservation or the idea that the best condition of public land is to keep it in its present condition and to keep it free from human touch (Oravec 1984). Ultimately, the human-nature relationship argues that an individual's opinion on a policy is intrinsically tied to where they fall on the preservation versus conservation dichotomy.

The third policy belief taken into account by the NPF is political ideology. Ideology, the placement of individuals along a continuum from liberal to conservative, has been shown to significantly influence an individual's policy preference (Converse 1964) (Zaller 1992). Lakoff (2002) provides the connection between narratives and ideology, arguing that two family metaphors exist around which conservatives and liberals orient themselves politically. Conservatives tend to orient themselves around the

Strict Father Morality[1] metaphor while liberals typically orient themselves around the Nurturing Parent Morality.[2] Lakoff (2002) associated the family as the nation and in doing so, argued that the children in the metaphors are akin to citizens while structural constraints are akin to rules and laws. In summary, political ideology policy beliefs are used by the NPF to theorize and empirical test the impact of structural constraints.

The NPF is a relatively young framework, thus there are numerous theoretical developments that need to be addressed, especially as they apply to the research question highlighted in this piece. The first theoretical development needed is the role of risk. Despite risk holding a substantial role in high-level nuclear waste research, it has not traditionally been incorporated within the various theories of public policy, including the NPF. This has changed recently with the forthcoming publication by Stoutenborough et al. (forthcoming). Stoutenborough et al. (forthcoming, …) argue that "risk perceptions should operate outside of the purview of the narrator and policy narrative" because at the micro level, there should be competing narratives battling for public opinion dominance. In addition, risk perceptions operate outside the narrative because "risk perceptions are built from a combination of social, constitutional, and cultural forces, risk-related information should be relatively slow to update...unless there is a massive, simultaneous shift within these forces" (Stoutenborough et al.. forthcoming, …).

Stoutenborough et al. (forthcoming: p. ...) argue that because the social, constitutional, and cultural forces are slow to change, they can buffer short-term

[1] Based on the principle that the father is the absolute moral authority where children learn right from wrong through strict structural constraints (Lakoff 2002).
[2] Based on the principle that parents share familial responsibilities, where a child's obedience is founded upon mutual love and respect (Lakoff 2002).

institutional and social changes thusly slowing the information update process and changes in risk perceptions. Because of this, risk perceptions are not something that can be changed through policy narratives, but they are something that can be mitigated through strategic usages of the victim narrative character.

The Stoutenborough et al. (forthcoming) work incorporated risk perceptions into the NPF, but has done so only on the micro level. This work argues that risk perceptions are impacted by societal, cultural, and constitutional forces that rarely change and because of this, they argue that a micro-level study is appropriate. One element that is missing from their study is the confirmatory role of policy narratives on the micro level to societal, cultural, and constitutional forces on the macro-level and the fact that at times, pressures exists that causes possible changes on the macro-level. The next section addresses the NPF and the macro level.

Narrative Policy Framework on the Macro Level

The macro-level is a widely studied yet inherently misunderstood level of analysis in most policy studies. On one hand, it is easy to get bogged down in the complexity of the system while failing to see the trees for the forest. On the other hand, it is easy to counteract the complexity with ultra-precise definitions and theories and miss the forest for one tree. Yet, what both of those world views, the view of the entire forest and the view of one single tree, misses is that there is an even greater force that constrains what type of trees or forests can exist or even their ability to exist in the first place. In an effort to move this analogy forward, let's call this greater force climate. Climate is an element that constrains all life and is changed overtime by all forms of life. Just like climate, the macro-level is on one hand a constraining mechanism of currently acceptable narratives

and on the other hand, is constructed over time either through the continual usage of consistent narratives or through the establishment of a strong lasting narrative strategy following major events like Black Tuesday, Pearl Harbor, or September 11th.

Constraining the Forrest

The constraining ability of the macro-level for the NPF is described above as a set of nearly universally accepted macro-narratives that both shape what the general public believes is acceptable and thusly the narrative strategies that can be used on the meso-level to create and to keep together coalitions of support. These macro-level narratives serve as sort of a filtering mechanism by defining what is correct and what is wrong or better yet, what is acceptable and what is not acceptable.

In order for macro-narratives to influence micro-level processes, they need to affect the evolving psychological processes that determine public opinion and participation including factors that determine affect, heuristics, emotions, and prior information. Cultural psychology argues that all social and emotional development of an individual—normally studied through children—occurs in a cultural context. In other words, human development is a factor of cultural phenomena (Shweder 1996). The cultural aspect of psychological development is based on social activities within a society, including work, education, play, health, adjudicating, and governing (Zinchenko 1984). These activities are conducted according to culturally centered behavior norms that are rewarded through prestige, wealth, privileges, rights, and opportunities. The distribution of these activities, culturally and institutionally controlled, determines the diversity of psychological phenomena within a society. Cultural psychology argues that psychological processes are organized by social concepts that depend upon the structure

of social activities, the natural environment, and concepts that are inspired by social activities and natural conditions (Ratner 1997). Lastly, while individuals develop their psychological processes, their development is based upon participation in collective cultural activities (Ratner 1997). Some macro level factors of cultural psychology are autonomy versus interdependence, physical versus tactile behavior, and collectivism versus individualism that varies based upon social[3] and ecological[4] factors that determine parental attention and learning aspects (Mosier and Rogoff 2003). Some additional macro level factors of cultural psychology include collectivism versus individualism.

An implementation of this theory is found in macro-cultural psychology, which argues that psychological phenomena are rooted in macro cultural factors such as social institutions, artifacts, and cultural concepts (Ratner 2011). These factors are constructed through struggles among competing groups, contested by vested interests, and modifiable (Ratner 2011). Changes in social policy and conditions tend to produce rapid, substantive, and widespread psychological changes (Ratner 2011). Some macro cultural factors for Ratner (2011) are romantic love[5] vs. puritanical love[6] and maternal love.[7]

[3] Group composition and values custom.
[4] Climate, food supply, environmental risks.
[5] Excluded personal relations from work relations, and situated loved in the realm of personal relations. Leads to the breakdown of community and the personalization of public life as one searches for their true love. Promoted the middle class family structure and individualistic beliefs. (Ratner 2011)
[6] Frugal, hard-working, serious, patriarchal, communitarian features with the family as the economic unit that lead to the association of socioeconomic norms of work with love. More communitarian. (Ratner 2011)
[7] A constructed emotion of what it means to be a "good mother." An example of this constructed emotion is the work in the 1920s and 30s by clothing manufactures to construct the needs of a child as one that needs constant love and have their needs satisfied quickly with needs defined as materialistic possessions. In addition, they defined a good life as one that has the more material possessions. (Cook 2004, 58).

Macro-narratives also represent the division of society into different competing and interacting groups that provide the bases of political participation. According to Ingram et al. (2007, 95), social construction is "a world-shaping exercise or, at least, encompasses varying ways in which the "realities" of the world are defined. This would include the use of images, stereotypes, and assignment of values to objects, people, and events (Stone 1999), that is, the elements that operationalize policy." Policymakers typically use social construction to project certain positive or negative stereotypes upon target populations within a society (Schneider and Ingram 1993). Positive construction helps to justify the distribution of benefits to a certain group while negative construction typically leads to punishment for anyone attempting to distribute benefits. The social construction of target populations framework argues that, in addition to benefits and burdens, policy designs include "putative goals to be achieved or problems to be solved, the tools that are intended to change behavior, rules for inclusion or exclusion, rationales that legitimate the policy and provide an internal cause and effect logic connecting means to ends, and the implementation structure" (Ingram et al. 2007, 95). These policy designs "structure the subsequent opportunities for participation, allocate material resources, and send messages that shape the political orientations and participation patterns of the target group as well as other members of the public" (Ingram et al. 2007, 97). Further macro factors according to the social construction of target population framework are institutions and culture[8], society[9], and policymaking dynamics.

[8] Public and elite opinion, social constructions of target populations, distribution of political power resources, and preferred knowledge systems (Ingram et al. 2007, 96)
[9] Democratic values, citizenship, problem-solving capacity, justice (Ingram et al. 2007, 96).

The previous paragraphs presented current literature on how macro factors can shape micro level factors of public opinion and participation, but how do macro factors impact meso level behavior? McBeth et al. (2007) argue that policy narratives created by coalitions on the meso-level include both policy beliefs and political strategies. Policy beliefs consist of "underlying beliefs in such issues as federalism, science, and the relationship between humans and nature (McBeth et al. 2007, 89) that are used to form coalitions. Some of these policy beliefs vary between groups; but some, are shared between groups. These shared beliefs are akin to what Sabatier and Jenkins-Smith (1999) call core beliefs, and remain relatively stable over short periods, but do experience shifts in response to external events and due to feedback loops from previous policy decisions. These shared primary beliefs are macro-narratives that serve as a litmus test for what is an acceptable coalition and what is not.

In addition to primary beliefs are political narrative strategies. Previously, I discussed the three primary narrative strategies that the NPF uses: scope of conflict, causal mechanisms, and the devil angel shift. Coalitions use these three strategies, on the meso-level, to shift the balance of order in favor of their chosen policy or to keep the status quo if the group perceives their self as currently winning. Each of these strategies are controlled by some macro level force of believability and the element that controls this believability is the macro-narrative. For example, within the U.S., any coalition that attempts to use policy narratives that cast senior citizens, veterans, or gold star families in a negative vein will have a hard time finding traction amongst the public on the micro level and would face coalitional instability, i.e. they will lose coalition members. In addition, any coalition in the U.S. that starts a discussion on the causes of U.S.

involvement in World War II without starting with Pearl Harbor would also find difficulty picking up traction amongst the public and will also face coalitional instability problems.

I described one element of macro-narratives in the previous paragraphs, how they affect meso-level coalition formation and micro-level public opinion formation and political participation. While this is beneficial, it is incomplete. In order to understand macro-narratives, we have to first understand how they are formed and change over time. The next section will offer an explanation for this phenomenon.

Constructing a Macro Reality

I have argued that macro narratives influence the construction of coalitions, the evolution of micro psychological processes, and participation levels within a society through the creation of target populations. While this is interesting, important, and necessary for the development of the theory, it is not complete. Many frameworks have macro-level conditions that are stated to affect policy making, but they are rooted in random natural processes and are spoken of as ever present and non-malleable. For a theory based on the idea that reality is constructed, expansion of this idea is needed. A key question of the macro-level NPF argument is how do policy narratives impact macro-level narratives? To answer this question, we must first answer whether current policies affect future policies, the so-called feedback effect.

Policies have both resource and interpretive effects (Pierson 1993). Resource effects affect the available resources to particular groups that provide the incentives to mobilize and advocate as well as means of coalition formation. One example is the GI Bill that provided soldiers educational and monetary resources that expanded their "civic

skills, social networks, income, and job prospects" (Mettler and SoRelle 2014, 167). Veterans—due in-part to their new resources—increased their participation in civic membership organizations—50 percent more than non-veterans—and in political activities—30 percent more than non-veterans (Mettler and SoRelle 2014, 167). In addition, due in part to their increased participation levels; veterans became an advantaged group allowing for future positive policies. Another resource effect is Campbell's (2002) study of Social Security. "The economic self-interest generated by the benefits compels seniors, particularly low and middle-income seniors, who rely most heavily on their monthly Social Security checks, to engage in a variety of political activities to encourage their representatives to protect those benefits" (Mettler and SoRelle 2014, 167). As with veterans, the increased participation levels of Social Security recipients influenced their creation as an advantaged group leading to future positive policies. Because both groups are advantaged, this affects the formation of coalitions due to the constraint on their ability to pass negative policies against either group.

Interpretive effects "convey messages to people about government or their relations to it or the status of other citizens, and the resulting attitudinal responses may shape people's subsequent participation" (Mettler and SoRelle 2014, 168). Interpretive effects are activated either by the result of resource effects or through the features of policy design and implementation. One possible understanding of interpretive effects previously mentioned is that policy can be designed and implemented in a manner that can divide the macro-polity into differing constructed identities. Society can be divided amongst those that are deserving and those that are non-deserving as well as those that

are earning and those that are welfare dependent (Schneider and Ingram 1993). These divisions are amplified through uses in popular media and in popular vernacular. Mettler and SoRelle (2014, 169) emphasize that one example of this constructed identity is the popular phrase "welfare queen" that became the counter-argument to any expansionary welfare policy since the 1990s.

Another possible understanding of interpretive effects is that policies are constructed and implemented in a manner that controls the scope of conflict (Schattschneider 1960). The scope of conflict affects the interpretation of a policy as either one that benefits a minority—welfare based—or one that benefits the majority. The shift influences the level of contention and thusly the level of elite and popular support—the more contentious the less popular support.

Interpretive effects can also be a direct result of elite and general public experience with a policy. If one has a "good" experience with a policy—their benefits are delivered on time or the line to apply for the benefits was not long—they are more likely to believe that the government should have a greater role in policy (Wood and Waterman 1994), or vise-versa (Soss 1999). In addition, if a policy is not associated with government at all—the supposed "submerged state" (Mettler 2011, 7) policies— policy success can lead to a greater appreciation of the "free-market." In either case, the experiences of an individual with a policy can affect the macro narrative of what should the scope of government be within a society which can impact whether a government can act in the future and overall opinions on governmental trust.

Lastly, these differing interpretation effects can shape both an individuals and groups view of the value of their citizenship and the efficacy of government agencies,

which ultimately impact their decision to participate in the future (Mettler and Soss 2004).

> If, for example, an individual is part of a target population ascribed with negative characteristics, he may view his own citizenship as worth less than that of others and be less likely to participate. Similarly, if an individual has negative experiences with government agencies, she may decide that participation is futile and choose not to engage. As in the case of the submerged state, if an individual has no concept that government is involved with the provision of a particular benefit, she may also be dissuaded from participating in political activity. (Mettler and SoRelle 2014, 172)

The changing participation levels of individuals and groups could then affect the construction of coalitions due to the want to secure a larger support group in an effort to secure a more favorable distribution of economic and political benefits.

In order for the resource and interpretive affects to hold as written above—the causal mechanism being policy design and implementation—I argue that we must assume individuals have some modicum of knowledge of the resources that they are gaining, some rational connection between implementation and their policy experience, and some rational ability to learn based solely on merit. The NPF questions the ability of individuals to objectively learn about policies and come to a non-biased evaluation. This belief leads the NPF to question the policy design and implementation centered feedback mechanisms as described above, especially the individualistic construction of the interpretive effect. The NPF argues, in sort of a grand model sense, that individuals have a low objective knowledge of public policy issues (Stoutenborough and Vedlitz 2014), a willingness to accept scientific knowledge only if it agrees with their prior beliefs (Kahan et al. 2011) (Oxley et al. 2014) and will change their beliefs only if the policy narrative was framed in a manner that agrees with their prior beliefs (Lybecker et al. 2013) or if the solution agrees with their prior beliefs (Campbell and Kay 2014). These beliefs lead to

the conclusion that the primary mover is not the policy design nor the policy implementation but instead is the policy narrative.[10]

In other words, narrative marketers utilize policy narratives to attempt to construct a reality that is closer to their policy beliefs and will lead to a positive return on their efforts. The policy narratives constructed by the narrative marketers are not boundless. To move policy closer to their policy beliefs and benefit economically from the policy, they must construct policy narratives that the public will believe/follow. In order to construct policy narratives that the public will believe/follow, narrative marketers will frame the narratives in a manner that agrees with macro-level factors. Lastly, the policy narratives can affect macro-level factors in the future by changing how individuals interpret the implementation of a policy and the benefits they receive.

The previous sections furthered the concept of macro-narratives and developed a preliminary theoretical understanding of how macro-narratives become-i.e., how they are developed and changed over time—and how macro-narratives impact the creation and strategies of coalitions on the meso-level and public opinion and political participation on the micro-level. While this is important for understanding the impact of macro-narratives it is a little cart-before-the-horse. Before any paper can theorize and empirically test the impact of macro-narratives and their genesis and change over time, they have to first theorize and identify possible macro-narratives. The next section will do exactly that.

[10] Recent public opinion over the Affordable Care Act is just one indicator of how policy narratives can trump policy benefits.

Ontological Security

Ontological security is defined as “a sense of continuity and order in events” (Giddens 1990, 243) or a “security of being” (Steele 2008). In other words, ontological security is "security not of the body but the self, subjective sense of who one is, which enables and motivates action and choice” (Mitzen 2006, 344). Actions by individuals that go against the self-identity of the individual cause a psychological condition known as ontological insecurity. Ontological insecurity "refers to deep, incapacitating state of not knowing which dangers to confront and which to ignore, i.e., how to get by in the world” (Mitzen 2006, 354). In moments of ontological insecurity, individuals spend considerable time and energy meeting immediate needs and do not plan for the future; there is no sense of self-agency. Opposite ontological insecurity is the condition of ontological security. An individual experiencing ontological security "has confident expectations, even if probabilistic, about the means-ends relationships that govern her social life" (Mitzen 2006, 45). In other words, the individual will know how to act and will have self-agency, even if they are not fully aware or cognizant of the correlation between their actions and their self-identity.

One of the critical factors of ontological security is uncertainty. An individual that is ontologically secure knows how to act in response to a situation and knows that their action will be recognized as acceptable by their social environment. Uncertainty can exist in many different forms. Hard uncertainty exists in situations where there are "novel or infrequent events {that are} simply impossible to know in advance," and it reduces the confidence actors can have in assessments over risk (Mitzen 2006, 346). In the face of hard uncertainty, individuals impose cognitive order upon the environment

based upon their knowledge of all events that could threaten the identity of the agent (Giddens 1991, 39 – 40). Mitzen (2006, 346) refers to this "knowledge of all events" as an individual's "basic trust system." The mechanism that generates basic trust for ontological security is routines that "regularizes social life, making it, and the self, knowable" (Mitzen 2006, 346). Routines are defined as "internally programmed cognitive and behavioral responses to information or stimuli" (Mitzen 2006, 346). Routines are automatic responses to external events and allow the individual to "pacify the cognitive environment, bounding the arena of deliberative choice" (Mitzen 2006, 347). In other words, routines "serve the cognitive function of providing individuals with ways of knowing the world and how to act, giving them a felt certainty that enables purposive choice" thusly, "inoculating individuals against the paralytic, deep fear of chaos" (Mitzen 2006, 347).

Routines require not only individual actions, but also predictable group responses, an element that can be affected by groups within society (Mitzen 2006). Imagine for a moment an individual that every Monday morning takes their trash to the street only to see that their neighbors have replicated their actions and are placing their trash out as well. Over time, this individual develops an attachment to this routinized behavior and the replication of actions by their neighbors. There is some external event—say a national disaster—that occurs in the individual's region. The individual will immediately engage in a routinized behavior—take the trash out on that Monday—in response to the feeling of hard uncertainty as to whether that individual's sense of being will be impacted by the natural disaster. If that individual's act of taking the trash out is reproduced by their neighbors—they are also taking their trash out—then that individual's uncertainty

may be relieved, and ontological security may be restored. However, if the neighbors do not reproduce the routine of taking the trash out, then the individual's feeling of hard uncertainty will only grow and maybe reach the point of ontological insecurity.

For individuals with a healthy basic trust—someone without hard uncertainty—

> "...when uncertainty arises, the individual compensates through various decision rules; when needs go unmet or routines are disrupted, these lacks are perceived as temporary… An actor with healthy basic trust can tolerate the uncertainty of small disruptions because she trusts routines will be re-established, or that the need eventually will be met through new routines" (Mitzen 2006, 350).

This trust allows the individual to learn and to work on interactions and self-esteem. In other words, to utilize hope, courage, and the capacity for creativity (Giddens 1991, 38).

Learning, sociation, and self-esteem prevent even the most significant disruptions from feeling threatening to the individual or from creating a sense of ontological insecurity. Returning to our taking out the trash example, an individual that returns home from work and sees that the trash is still there may assume that the trash will be picked up the next day or will turn to other routines as long as they have a healthy basic trust. In other words, the disruption of trash service would be considered a minor disruption and will not have any effect on the individual's ontological security.

An individual with maladaptive basic trust "treats routines as ends in themselves rather than a means toward realizing her goals" (Mitzen 2006, 350). When routines become the sole interest of the individual, instead of a means to secure their self-identity, even temporary disruptions become threatening, and the response is to cling even tighter to the routines creating an ever more routinized society. Within a society defined with maladaptive trust, individuals cannot learn and/or respond flexibly to threats leading to motivation bias (Mitzen 2006) (Jervis, Lebow, and Stein 1985). In other words, our

individual—defined with maladaptive basic trust—upon seeing that their trash was not collected or seeing that their neighbors were not reproducing their actions of taking the trash out, would most certainly experience ontological insecurity. As such, the individual would spend the entire day trying to find out why their trash was not picked up and/or would knock on each of their neighbors' doors finding out why they were not taking their trash out. Until that basic need is met or society reproduces their routine, that individual would not be able to engage in any other actions and will continue to take their trash out every day in hopes that their neighbors will replicate their routine and that the trash would be picked up that day.

Within the logic of the Narrative Policy Framework, routines are macro-narratives. Instead of routines being some action that an individual engages in everyday that produce ontological security, routines are intellectual experiences or thoughts that an individual engages in that justifies their daily activities. In other words, they are policy beliefs. September 11th, 2001 was one of the defining moments of the recent generation and after that faithful day, President George W. Bush stated:

> …These acts of mass murder were intended to frighten our nation into chaos and retreat. But they have failed. Our country is strong. A great people has been moved to defend a great nation.
> Terrorist attacks can shake the foundations of our biggest buildings, but they cannot touch the foundation of America. These acts shatter steel, but they cannot dent the steel of American resolve.
> America was targeted for attack because we're the brightest beacon for freedom and opportunity in the world. And no one will keep that light from shining.
> Today, our nation saw evil, the very worst of human nature, and we responded with the best of America, with the daring of our rescue workers, with the caring for strangers and neighbors who came to give blood and help in any way they could… (Text of Bush's address)

Within his speech, President Bush relied upon routinized elements of American identity in an effort to secure ontological security. In the terms of the Narrative Policy

Framework, he utilized macro-narratives of American identity to increase support for an upcoming policy. But ontological security talks about the individual, not the state. Can a state have an identity?

Ontological Security of the State

Ontological security was developed as an individual level understanding of human nature, but ontological security can be applied to the state. Wendt (1999) argues that states have both a physical and social drive, that they are social actors that want to affirm self-identity and will pursue a policy that reflects that identity. While ontological security was developed by Giddens (1984; 1990) to discuss a psychological process that individuals go through, it is not a stretch to apply ontological security to the nation-state or at the very least to state-agents. Mitzen (2006, 352) argues, "society must be cognitively stable in order to secure the identities of individuals and as such individuals will begin to attach to these stable group identities." This attachment to group identities is developed through routinized opposition to the other groups (Brewer 1999) (Mercer 1995) and this in-group/out-group behavior is aggregated to the national level through domestic politics.

A second reason for the ability to ascribe individual level values to the nation-state or state agents is that emotions are the foundation of many international relations theories (Steele 2008). Neorealist and neoliberal approaches to international relations are based on the individual emotions of fear and hate that theoretically drive state behavior (Steele 2008, 16). In neoconservative theories of international relations, the "state agent creates an emotional connection that fetishizes the authority of a nation-state to promote

the ‘national-interest' (Steele 2008, 16). Ontological security's notion of self-identity is based on emotion and as such, applying it to the state is consistent with existing theories of international relations.

A third reason why individual notions of ontological security can be ascribed to the state or state agents is that the ontological security of states satisfies the ontological security of its members (Mitzen 2006). The security of the state is paramount for members of the state and as such, as long as the state acts in a manner conducive to ensuring its security, however security is defined, then individual members of that state will feel secure (Mitzen 2006). Fourth, "it makes sense to speak of states as if they were agents when the agency of individuals in a representative capacity carries the allocative and authoritative resources of the state with it (McSweeney 1999, 151). While individuals make decisions and those decisions are carried out and responded to by individuals, each action of an individual on the international level is considered action by the entire state as long as that individual is in a representative or authoritative capacity.

The previous justifications for why individual notions of ontological security can be ascribed to the state or state agents is authoritative but not as conclusive and sophisticated as they could be (Steele 2008, 18). The most sophisticated reason for the extension of individual-level ontological security to the state or state agents is Lang's (2002) individual vs. collective argument (Steele 2008, 18).

Constructing the Self of the State

State agents are the state because they represent their state and “because they have the moral burden of making policy choices and the capacity to implement those

decisions" (Steele 2008, 18). The state in this viewpoint is seen as a "structure that constrain(s) and enable(s) those individuals who hold positions of responsibility in the state" (Wheeler 2002, 22). The important element within Lang's (2002) argument is not the "personal insecurities of leaders…[but instead]…how leaders recognize the position of their state's 'Self" in international society" (Steele 2008, 19).

> These representatives not only represent the interests of the citizens of a state, but they also represent the state to the representatives and the citizens of other states…The representative or diplomat embodies the state in moments of agency. Even more importantly, Morgenthau's conception of state agency implies that only in those moments of diplomatic action does the state come into existence. Otherwise, it only exists in potential; the representative must actualize the power of the state. (Lang 2002, 16-17)

The mechanism through which state agents promote ontological security or actualize the state's image in times of ontological insecurity is narrative (Steele 2008).

The state agent responsible for narrating state action has to "limit the number of events in a particular history" by crafting a narrative that organizes memory of historical events (Steele 2008, 19). Despite the state agent as the state approach, Steele (2008) is quick to note that this does not presuppose that decisions are made outside of a social environment. Decisions by state agents brought about by ontological security concerns are socially constructed. In fact, "the concern…is not what international society would think of the respective states, but how, upon reflection, the state itself would be able to organize those actions in a future narrative that maintained a sense of self-integrity" (Steele 2008, 20). In other words, we derive a self-identity based upon our understanding of the other. "Narrative provides a coherence to the self," and without narratives, the self does not exist (Steele 2008, 20). In order to understand the policy process of high-level

nuclear waste nuclear repositories, we have to understand how states construct their vision of the self through the ontological security process of narratives.

There are many possibilities of the self (Steele 2008). When it comes to a state's self-identity, Steele (2008, 50) argues that there are four components of the ontological security process of constructing the self: (1) material and reflexive capabilities; (2) crisis assessment; (3) the biographical narrative a state employs to justify and describe its actions, where we can see how state agents "work out" their understandings of their state's self-identity; and (4) co-actor discourse strategies (used to generate ontological insecurity in a state or states to "compel a state to act according to its articulated sense of "self-identity."

The role of material and reflexive capabilities in the ontological security process is in determining opportunity and ability to impact policy. In short, "we feel less anxiety for situations we think we cannot change" (Steele 2008, 70). If we connect repositories with an ethical notion of disposing of nuclear waste, a society that does not have the space nor means of building a repository is less likely to feel anxious over choosing not to build a repository merely because they do not have the material capabilities necessary to construct one. Lastly, a nation-state that does not have the reflexive relationship—cause and effect—between nuclear capabilities and waste is less likely to feel anxious over not constructing a repository to properly store the waste produced as a result of their ever-increasing electric lifestyle. In other words, those without material or reflexive capabilities can ignore the problem and move on with their daily life, remaining ontologically secure despite their actions going against their self-identity.

The second process of constructing the self encompasses crises statements (Steele 2008). Crises statements are socially constructed statements by agents that "construct a situation as a crisis, plausibly link(s) that crisis to the national self, and identify(s) which policy might effectively terminate the crisis" (Steele 2008, 71). If a state has the capability and ability to affect a policy area, crises statements convince the state that action is appropriate by linking action to the constructed self-identity of the state. Crises statements will also help states determine appropriate action by linking a specific action with a state's self-identity.

While self-identities may be the starting point for determining whether a state acts or how they act, self-identities are mutually constituted. Crises statements construct crises, but the third element of self-identity construction, biographical narratives, construct self-identity including evaluating the "social settings and the placement of their Selves in those settings" (Steele 2008, 71) and the means of creating meaning for action (Giddens 1984). To extend individual level ontological security to the nation-state, the biographical narrative also organizes the state by creating an internal self and an internal other and by prioritizing state roles in the carrying out of the self (Steele 2008). There are four processes within the biographical narrative:

> (1) what "causes" or "drives" events; (2) what the event means about an actor's self-identity; (3) how those events are important to an actor's interests, or how interests are derived from the self-identity of an actor in relation to the event; and (4) what policies…a state should use to pursue those interests" (Steele 2008, 72).

Biographical narratives are supposed to produce stability of the self throughout the policy process, but it is not always successful due to changing "critical situations" and due to the strength of the biographical narrative in the first place (Steele 2008, 73).

> Just like all other narratives in International Relations, the biographical narrative constructs a reality as perceived by an actor. State agents related their identity to their actions and place the self in the context of a(n) (international community. Narratives create meanings of an event and make sense of how events are connected: "Narrative bring temporal events together such that meaning can be ascribed to a pattern. The organization of time itself endows meaning to events" (Bach 1999, 46) The language a state uses to describe its actions influences future decisions: "to involve some property of language called illocutionary force is indeed to leave behind the longstanding view, on which positivism depends, that the (only) function of language is to represent reality" (Onuf 1989, 82). (Steele 2008, 73)

Lastly, co-actor discourse strategies, the fourth element of self-identity construction, are strategies used by the other in an attempt to change the state's action through redefining the self. In order for an actor to be open to changing their beliefs, they have to be receptive to change, which depends on "the fit between the self-conceptualization of the actors' identity and the proposed normative belief (Crawford 2002, 114). The self in this manner is similar to political identity which Crawford (2002, 144) argues consists of at least three components: a sense of self in relation to or distinct from others, a historical narrative about the self, and an ideology. In order to get an actor to change their political identity and thusly their conception of the self and the other, they either have to be shamed (Giddens 1990)—the stick approach—or lobbied (Crawford 2002)—the carrot approach—and central elements of this shaming or lobbying are the crises statements and biographical narratives. The crises statements and biographical narratives are constructed by the other in a manner that either attack the actions of the state as against the self-identity of the state—shaming—or in a manner that tries to convince entice the state to adopt a set of actions in agreement with the self-identity constructed by the other.

Ontological Security Theory as theorized by Steele (2008), and the arguments put forth by Crawford (2002), argue that the shaming or lobbying is done by other nation-states or actors in the international system—an argument that is entirely plausible—but the domestic actors in a nation state can shame and lobby as well. The domestic actor lens of International Relations has a long history that goes back before the first great debate and has been used to offer unique and alternative empirically supported hypotheses. We would be amiss if we did not extend Ontological Security Theory to the domestic arena. In order to do this, we need to combine the Ontological Security Theory with the NPF.

Combining Theoretical Frameworks

Ontological Security Theory, as argued in this paper, presents an argument on the domestic level. Combining the domestic level understanding of the Ontological Security Theory with the NPF would necessitate using the meso-level unit of analysis. The NPF on the meso-level studies the impact of policy narratives on public policymaking within policy subsystems. Policy actors at the meso-level may "derive from institutions or organizations (e.g., a member of the media or the British parliament), play different roles (e.g., citizens or political leaders), and organize in networks (e.g., advocacy coalitions, interest groups, organizations) (Shanahan et al., 2018, 188). These actors "develop and adopt policy narratives to reflect their policy preferences" and "competing policy actors have divergent policy preferences, which are expressed in policy narratives" (Shanahan et al. 2018, 188). The NPF model of meso-level narratives argues that policy actors will divide into two coalitions of policy preferences, each group will develop policy narratives using a combination of narrative components to advocate for their policy preference,

which is hypothesized to affect policy beliefs and individual policy preferences on the micro level (Shanahan et al. 2018). Current meso-level applications include but are not limited to: expanding and limiting the scope of a policy based upon perceived outcomes (McBeth et al. 2007) (Shanahan et al. 2013) (Jones and McBeth 2010), using policy narratives to impact the composition of coalitions (Jones and McBeth 2010), and the association of policy intractability with higher incidences of the devil shift (Shanahan et al. 2013).

One of the significant findings of the NPF on the meso-level is the impact that different policy beliefs have on the policy process. As discussed earlier, one of the theoretical foundations of the impact of policy beliefs is Cultural Theory, which seeks to understand how and why individuals form judgments about danger, pollution, and threat as a condition of social context (Douglas 1966; 1978) (Wildavsky and Douglas 1982). As a theory of risk, Cultural Theory is a good starting point for a discussion on the impact of narratives on the policy process of nuclear waste repositories. High-level nuclear waste deep geological repositories are massive undertakings that can take over thirty years from initial discussions to the first deposited canister of high-level nuclear waste. Once the first canister of high-level nuclear waste is deposited, the repository will have to remain open, and the transportation routes to the repository will have to remain open for as long as it takes to fill the repository. Lastly, once the repository is filled and sealed off, it will have to remain secure for thousands of years until the half-life of the deposited high-level of nuclear waste has expired. In order to accomplish either of these requirements, let alone all three, a culture has to exist, or a cultural shift needs to occur that will accept the risks associated with nuclear waste repositories.

The strength of Cultural Theory for understanding the impact of risk for narrative studies is its argument that social debates about risk cannot be reduced to concerns about safety (Douglas 1966; 1978) (Wildavsky and Douglas 1982). Instead, Cultural Theory argues that social debates about risk are inseparable from issues relating to power, justice, and legitimacy (Douglas 1966; 1978) (Wildavsky and Douglas 1982). In making this argument, Cultural Theory places the crux of social understandings of risk squarely on the mechanisms that shape power, justice, and legitimacy. In other words, on narratives. In addition, Cultural Theory provides normative guidelines that emphasize the importance of the processes by which decisions regarding risk are made. In summary, Cultural Theory suggests that "the views of any particular individual on matters are shaped by the nature of social groups of which they are a part, i.e., various organizations, peer group influence or other sources of authority, and by the degree to which individuals feel bonded to larger social groups" (Tansey and O'Riordan 1999, 71). Thusly, "attitude(s) and judgment (s) about risks and about the pattern of social justice and responsible government are set in cultural relationships, namely the expectations and value systems of people belonging to the distinctive groups" (Tansey and O'Riordan 1999, 71).

Cultural theory argues that risk is a politicized concept that is a function of "fairness considerations such as trust, liability distribution, and consent" (Rayner 1993; 198). The politicization of risk is conducted, according to the NPF, by advocacy groups on the meso level through political narratives. Culture is defined in Cultural Theory as "the common way that a community of persons makes sense of the world…a set of plans, instructions, and rules" (Gross and Rayner 1985, 1-3). These plans, instructions, and

rules are developed, spread and maintained by policy narratives. The first assumption of cultural theory is that members of groups with a common outlook impose order on reality. This order on reality affects the policy process by creating commonalities of constructed thoughts and actions or normality. One means of constructing common worldviews or senses is ontological security. In review, ontological security is defined as "a sense of continuity and order in events." It is a sense of comfort in an individual's everyday lives. In other words, it is a "security of being" (Steele 2008).

Ontological Security Theory presents an alternative policy belief that can expand the understanding of narratives on the policy process through a risk approach. Ontological Security Theory argues that—based upon the theory developed in Steele (2008)—nation-states construct a self-identity based upon the self of the leadership. When the nation-state engages in any action, if they have the reflexive or material capabilities to believe that they can affect a situation, the situation is framed based upon the nation states self-identity as a crisis and deserving of action. Actors within the nation-state then construct a biographical narrative in which they argue why action is in agreement with the self-identity of the state, and then co-actors will either shame or lobby the nation-state to change their construction of the crisis and their biographical narrative in a manner that coincides with the wishes of the co-actor. The process by which ontological security affects a nation-state's action correlates with the process in which narratives impact policy changes as argued within the Narrative Policy Framework.

In summary, states will utilize macro-narratives on the international level that are associated with the self-identity of the state. The mechanism that keeps them from using macro-narratives counter the self-identity of the state is the carrot and stick approach of

lobbying and shaming. The actors that will engage in the accountability of state actors on the international level are coalitions on the meso-level. Despite the theoretical presence of this accountability mechanism, the question remains, what are the self-identities of the state?

Self-Identities of the State

Ontological Security Theory presents two possible self-identities of a state: moral/humanitarianism and honor/glory (Steele 2008). While these self-identities of the state are impactful, they are limited for our purposes. Perhaps a more expansive set of self-identities for this particular study is what Fettweis (2013) calls the "pathologies of power." Fettweis' (2013) pathologies of power include honor, glory, and hubris. According to Fettweis (2013, 14) these beliefs affect "real-world decisions in consistent, predictable, and occasionally destructive ways. These pathologies of power, to put into the framework of the OST and the NPF, are self-identities that are socially constructed through policy narratives, they are challenged through alternative policy narratives by social agents in advocacy coalitions, and both advocacy coalitions manipulate them through narrative strategies in hopes of causing policy change.

The purpose of honor narratives is to define credibility through what Feittweis (2013) defines as the credibility imperative. Honor is defined by Feittweis (2013, 97) as the "resolve to respond to provocation or insult." Honor narratives socially construct what a provocation or an insult is and how a state should respond to provocations and insults. It is a credibility imperative because it defines the role of the state (or its leader) as one that protects the honor of the state and its people. A state may engage in an act that is deemed "irrational" solely because not engaging in the act would question the

honor of the state. The leader on the international level also can utilize honor based narratives in an attempt to influence future decisions of actors (Feittweis 2013) in a manner close to creating a new macro-narrative. This ability is especially important in democratic societies hoping to start a policy process as long as one related to deep geological repositories.

The power of the honor narrative is that it helps a state bypass the bargaining problem of credible commitments. A state in a situation defined with incomplete information and with disagreements over relative power cannot credibly commit to peaceful acts in the present or the future given the incentives to misrepresent information and power levels (Fearon 1995). One of the solutions to the inability of a state to credibly commit is tying hands through signaling (Fearon 1997). States tie their hands by creating audience costs that the leader will suffer if they break from the action (Fearon 1997). One means of tying hands is by creating an honor culture around a particular course of actions (Fettweis 2013). While signaling research has been applied historical for state to state actions and within conflict literature, there is no reason why, given the theoretical application derived in this paper, that it cannot be applied domestically between coalitions. In this application, the coalition in power would create an honor culture within their state around a set of actions to ensure that their policy legacy survives their term of office by tying the hands of future leadership. They do this by using policy narratives that tie honor to ontological security to develop audience costs for different behavior.

If honor narratives define the credibility imperative, glory narratives define the prestige imperative (Feittweis 2013). If there is one imperative that remains consistent

across theories of international relations, it is that states compete against one another. What differs between the theories is exactly what states compete over and how important this competition is for the state. Prestige comes from a state "winning," and glory narratives define what states are competing over and how well that state is doing in the competition. In other words, glory narratives define the proverbial battleground, what is winning, and who is/is not winning.

The last policy belief explored in this research project is the role of hubris. To put it bluntly, the purpose of hubris narratives is the keep the faith. In order to act, a group of people has to believe that they can (Steele 2008). They have to believe that they have the power and the capabilities in order to accomplish the goals of the policy. Hubris narratives establish and upkeep this belief. Hubris though leads to an overestimation of capabilities making the action more likely, leads to the misjudging of the actions of others, and causes a state to ignore the advice of others that run counter to the beliefs of the state (Fettweis 2013). The power of hubris when it comes to this research project is that it could be an indicator of the failure to build a repository, either that a current attempt is going to fail or that the initial proposal will ultimately fail. In summary, hubris is a last hearted attempt to save what ultimately may be a failed policy.

While Fettweis (2013) utilized the “pathologies of power” to understand U.S. foreign policy and even argued that they are not found in other nations, there is no reason to believe that Fettweis’ (2013) exceptionalism belief of U.S. foreign policy statement is correct. If the theoretical understanding of state action developed here is correct, it will make sense for states to use honor, glory, and hubris in order to enact policy through fear

based narratives. In order to understand the impact of fear based narratives, we have to first understand the usage of fear in international issues.

Fear in International Issues

Fear is a concept that is inherently assumed in much of international relations theory—it is the premise of security concerns and the foundation of the impact of anarchy—but it is one that has not really been systematically studied by classical theories of international relations (Crawford 2000) despite their assumption of it. In her seminal work, Crawford (2000) carefully and critically assesses the role of emotions, the primary emotion being fear, in international relations theory. Crawford (2000) argues that one of Robert Gilpin's (1986, 305) main points is that "men are motivated by honor, greed, and above all, fear." Crawford (2000) further states that Hobbes' (1986) *Leviathan* makes fear a central concept of politics. "The passions that encline (sic) men to Peace, are Feare (sic) of Death; Desire of such things as are necessary to commodious living; and a Hope by their Industry to obtain them" (Hobbes, 1986, 188). Crawford's (2000, 120) argument is extended to Thucydides, "fear justifies behaviors that might otherwise be difficult to justify" and Clausewitz (1984, 89) who stated that war by its nature is defined by "primordial violence, hatred, and enmity, which are to be regarded as a blind natural force, of the play of change and probability within which the creative spirit is free to roam; and of its element of subordination, as an instrument of policy, which makes it subject to reason alone."

In more modern times, Crawford (2000) states that classical realist Quincy Wright (1942) used the notion of mutual fear as an explanation of war onset mainly through its ability to keep undesirable rulers in power. In addition, Crawford (2000) argues that even

the foundation of classical realism and neorealism rests on the importance of fear. Morgenthau (1948, 122-123) argues that "personal fears are transformed into anxiety for the nation" and Waltz (1979, 118) argues that "a self-help system is one in which those who do not help themselves, or who do so less effectively than others, will fail to prosper, will lay themselves open to dangers, will suffer. Fear of such unwanted consequences stimulates states to behave in ways that tend toward the creation of balances of power." Lastly, Harold Lasswell (1965, 57) argues in his frustration-aggression hypothesis that

> The expectation that violence will ultimately settle the clashing demands of nations and classes means that every detail of social change tends to be assessed in terms of its effect on fighting effectiveness, divides participants into two conflicting camps, segregates attitudes of friendliness and of hostility geographically, and creates profound emotion insecurities in the process of rearranging the current political alignment…The flight into danger becomes an insecurity to end insecurity.

Despite the early importance of fear, it disappeared from international relations theory in the mid-twentieth century due in part to the rise of the rational actor paradigm (Crawford 2000, 122). A rational actor, as defined by rational choice theory, is one that does not act based upon emotions like fear or better yet, one whose emotion is overcame by rational calculations of expected utility calculations (i.e. Downs 1957). The result of the disappearance of fear from international relations theory is "politics without passion or principles which is hardly the politics of the world in which we live" (Finnemore and Sikkink 1998, 916).

Recently, international relations research has experienced what may be called an emotional turn and has produced new takes on traditional theoretical understandings of international relations including but not limited to diplomacy, alliances, sovereignty, intervention, international ethics, peacebuilding, and humanitarianism (e.g. Crawford,

2000; 2014; Fierke, 2013; Hall, 2015; Holmes, 2018; Jeffery, 2014; Mercer, 2010; Petersen, 2011; and Ross, 2014). One of the main problems of emotion in international relations is a systemic understanding of how the three images of international relations interact: system, state, and individual (Hutchinson and Bleiker 2014). The framework developed in this work does exactly this, it discusses the creation, upkeep, and power of macro level narratives of fear on constraining the policy narratives available to state level coalitions and the ultimate impact of macro-level narratives of fear on individual level behavior. What is missing is an operationalization of the main macro-narrative of emotion that leads to a departure from the "rational" and towards the "irrational" for this chapter, fear.[11]

Fear

Fear has been a key emotion for much of international relations theory, despite its non-systemic usage. While the impact of fear has either been assumed or explicitly researched in much of the earlier works of IR theory, the notion has not until relatively recently moved from the independent variable position to the dependent variable position. One of the primary examples of fear as a dependent variable, though outside the field of international relations, is the concept of a "culture of fear." Barry Glassner (2000, xix) popularized the concept of a culture of fear in his attempt to answer these questions:

> Why are so many fears in the air, and so many of them unfounded? Why, as crime rates plunged throughout the 1990s, did two-thirds of Americans believe they were soaring? How did it come about by mid-decade 62 percent of us described

[11] What I refer to as rational in this paper is fact based decision-making and irrational is emotion based decision-making. I completely understand that emotional based decision making is rational to large groups of individuals. But, this is exactly what this body of research studies. Scientific researchers love to utter phrases like "let the facts speak for themselves," but they rarely do speak for themselves. They are interpreted based upon a host of facts such as emotion.

> ourselves as "truly desperate" about crime—almost twice as many as in the late 1980s, when crime rates were higher? Why, on a survey in 1997, when the crime rate had already fallen for a half-dozen consecutive years, did more than half of us disagree with the statement "This country is finally beginning to make some progress in solving the crime problem?

Glassner's (2000) explanation for this unfounded fear is rather simplistic—in his own words. The reason why Americans fear what they shouldn't and do not fear what they should is that politicians and the media have taken advantage of the hysteria inducing turn of the millennium and have started to market stories and elections around concepts of fear. In summary, the media and politicians over sensationalizes concepts that the public wants to hear and uses catchy titles like "Don't miss Dateline tonight or YOU could be the next victim!" Glassner (2018, xxxiv). But this social amplification like concept is incomplete, it does not answer important questions like "why particular anxieties take hold when they do," and "why do news organizations and their audiences find themselves drawn to one hazard rather than another" (Glassner 2018, 5). Glassner (2018) does not provide an understanding for the strategic usage of fear, just its presence. In addition, Glassner's (2018) tie of fear to current causal factors—turn of the millennium—ignores the fact that fear has constantly been a tool by those in power to stay in power as the previous overview of international relations theory by Crawford (2000) suggests. Instead, we need to expand upon this concept beyond Glassner's (2000; 2018) notion of a culture of fear to understand its mechanism, how it is utilized, and the strategic logic behind its management.

A second example of fear as a dependent variable is Fettweis' (2013) pathology of power. Fettweis (2013, 25) argues that inherent in all human beings is an insecurity of leaders and individuals in which "they harbor extreme suspicion of, and hostility towards, those around them...because paranoid individuals tend to project their own mindset onto

others, believing that their opponents think and act as they do." Secondly, "paranoid people tend to exhibit "centrality," or the assumption that they are the root cause of all that goes around them" (Fettweis 2012, 26). Lastly, "political paranoia routinely generates what to outsiders appears to be delusional thinking, the most significant manifestation of which is a grandiose sense of self" (Fettweis 2013, 26). These three conditions of fear can lead an individual to warped and inaccurate processing of incoming information and thusly to counterproductive decisions. In summary, Fettweis (2012) states that fear is the end result of individuals, being naturally paranoid, centralizing the perceived responsibilities of their position with their perceived ability to be a force of change and ultimately leading to what this paper refers to as "irrational" decision-making.

Fettweis' (2013, 49) insecurity pathology may exist more in the minds of leaders because they "must bear the burden of protecting the people, a position that rewards suspicion and distrust of others" but that does not mean that only leaders bear the burden of protection. In other words, fear is the result of duty and responsibility and that while leaders may have a greater sense of duty and responsibility, all individuals have this condition to some level. All actions, whether it is the protection of the world or the state starts with the protection of the self (Giddens 1991) and this protection of the self extends to state leaders (Steele 2008). Through an ontological security perceptive, Fettweis' (2013) insecurity pathology becomes a pathology of the insecurity of the self, an insecurity of the self that is constantly present and the genesis of fear. But this begs the questions, what impacts the insecurity of the self and how does this insecurity impact decision-making.

Insecurity of the self is constantly present and exists on a cultural level due to unique factors to each individual, state, and the international system. These unique factors

could include, for the United States, beliefs in U.S. exceptionalism, religiosity, certain political ideologies like neoconservatism, geographical and historical factors, and its media mentality of "if its bleeds it leads" (Fettweis 2013, 56) as was originally described by Glassner (2000; 2018). Fettweis (2013) expands upon the culture of fear as described by Glassner (2000) but still falls victim to the main critique of Glassner (2000). Fettweis (2013) argues that these factors produce a self-identity and lead to perceptions of fear, but he does not theoretically describe how these conceptions are used. In fact, this is a similar critique of Glassner (2000; 2018) as previously mentioned. Namely, why do certain fears take hold when they do and why are politicians and the media drawn to specific fears over other fears. These issues lead to this dissertation's second research question: How is risk defined and refined throughout the policy process? To understand how to answer to this, we must utilize the framework developed in this chapter that includes both the Ontological Security Theory and the Narrative Policy Framework.

Application of the Narrative Policy Framework and Ontological Security

Within Ontological Security Theory, security is the security of being (Steele 2008). Individuals are structured by routines and self-identity, insecurity comes from anxiety or an uncomfortable disconnect with the self (Steele 2008). The outcome of a decision that counters one's self-identity is shame, this shame is caused because of discursive remorse or a departure of action from the self's biographical narrative (Steele 2008). Structural change occurs due to routinized critical situations that cause changes in self-identity and routines (Steele 2008, 44). In this vein, fear is the end result of discursive remorse.

Discursive remorse is simply "the process through which [dominant] reality comes into being" through the use of language to create accepted norms based upon power

relations (Foucault 1971). This power relationship creates "a sense of continuity and order in events" (Giddens 1990, 253) or an ontological security. Ontological security is further defined as a "security of being" (Steele 2008) or a "security not of the body but the self, subjective sense of who one is, which enables and motivates action and choice" (Mitzen 2006, 344). Actions that go against the self-identity of the individual, through a discursive remorse process, can lead to ontological insecurity. In other words, the feeling of uncertainty about one's actions or the actions of the greater self—groups/nation that one belongs to—due to the divergence of the action from one's self-identity created through power relationships.

One of the possible producers of ontological insecurity are novel or infrequent events. Novel or infrequent events "that are simply impossible to know in advance can lead to hard uncertainty and reduces the confidence actors have in their assessments over risk" (Mitizen 2006, 356). Under conditions of hard uncertainty, "individuals impose cognitive order upon the environment based upon their knowledge of all events or their basic trust system that could threaten their self-identity" (Mitzen 2006, 346). In conditions that may produce high uncertainty, discursive marketers will utilize discursive remorse to shame individuals into questioning their self-identity in light of actions that may be perceived as disconnected from self-identity through forcing individuals into a routinized behavior or thought process. In other words, in situations that arise from either political decisions of "novel or infrequent events" (Mitzen 2006, 346), political actors will utilize fear-based macro-narratives in an attempt to prevent the oncoming of hard uncertainty and the rise of a new power arrangement that may question their survival.

Ontological security-seeking behavior is "the drive to minimize hard uncertainty by imposing cognitive order on the environment…by developing a cognitive order on the environment" (Mitzen 2006, 346). This cognitive order "brackets on the level of practice possible events which could threaten the bodily or psychological integrity of the agent (Giddens 1991, 39 – 40). Bracketing hard uncertainty is what Glassner (2000; 2018) experienced with the turn of the millennium, he admittedly did not theorize the how. Despite the advancements of Ontological Security Theory on the understanding of the impact of fear on decision-making, it is rather unclear as to the events that actually produce uncertainty. In short, the when and why. For this, we need to turn to the theories of public policy, especially the conception of focusing events.

Focusing events are theorized differently by each of the public policy theories but in general, they all consider them to be "the" or "a" producer of policy change. Focusing events are defined as an "event that is sudden; relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially greater future harms; has harms that are concentrated in a particular geographical area or community of interest; and that is known to policy makers and the public simultaneously" (Birkland 1998, 54). In addition, focusing events are also defined as "circumstantial reactors" or an unanticipated event that results in issue initiation (Cobb and Elder 1972, 83). Lastly, focusing events can be defined as "dramatic series of events" leading to a discovery of a problem by the public (Downs 1972). In short, focusing events are "novel and infrequent events" that Ontological Security Theory is built around, can lead to ontological insecurity, and necessitate the need for the "bracketing of uncertainty."

Focusing events can produce policy change—the how—by mobilizing groups as well as leading to issue expansion, resulting in agenda setting (Birkland 1998). In addition, focusing events, circumstantial reactors, or exogenous events can open "windows of opportunity" that can allow policy actors to change policy in their favor (Kingdon 1984). The mechanism that can produce this change is the production of causal stories linking a current policy with the event (Stone 1988). These causal stories are produced by policy actors that hope to benefit from the change through a change in governing coalitions to a redistribution of resources through an expansion of the scope of conflict (Schattschneider 1960). Despite the research linking external events with policy change, one key factor has been under researched, policy change is not inevitable. In other words, much of the policy research have utilized external events to explain policy change post fact, but not much have focused on how external events could actually lead to policy stasis or why some events produce change and some do not.

Just because a hurricane, earthquake, nuclear accident, or any other event occurs does not mean that the event will become a focusing event and produce policy change. Actions leading up to the possible focusing event establishes a policy regime that benefits from the current distribution of resources and as such, prefers to keep the current distribution of resources. They will engage in actions to prevent policy change. On the other hand, there is a group that would benefit from a change in policy regimes and as such will engage in actions they hope will produce change. But which strategies are they using to keep the status quo or produce change? According to the argument presented in this paper, this competition between staying the status quo and change is based upon a

competition by discursive marketers using discursive remorse to shame individuals into either staying the status quo or changing.

The use of shame to influence policy is not a new concept. Research into the connection between INGOs and MNCs have found that public shaming of a country's human rights history impacts foreign direct investment (Franklin 2008) (Murdie 2009) (Barry et al. 2013). Adlet-Nissen (2014) finds that states actually fight against the impact of shame by engaging in stigma management by rejecting current norms of behavior and proposing alternative norms. While this body of research has been influential and important, it does not go beyond naming and shaming. In other words, it does not go into the discursive elements of shaming as mentioned in this work and for that reason, I propose a more narrative assessment of shaming in an effort to understand policy change and stagnation post external event.

The essence of cognitive order is a story that all is okay, that tomorrow will be better than today, that life can go on as normal. In other words, the essence of cognitive order is narrative and the policy framework that implements the power of narratives is the Narrative Policy Framework. The Narrative Policy Framework theorizes the impact of policy narratives on policy change on the macro, meso, and micro level. I will focus primarily on the macro level.

The macro-level is the most underdeveloped level of analysis for the Narrative Policy Framework but has recently received renewed attention. The main focus on the macro-level is on "how policy narratives embedded in cultures and institutions shape public policy" (McBeth et al 2014, 230). The first piece to explore this macro-narrative phenomena is McBeth and Shanahan (2004, 319 - 320) that argues that "[policy narratives]

develop among policy actors and the public at large" through "backwards loops" (Clemons and McBeth 2001) by limiting the available "acceptable" policy narratives that policy marketers can use to construct and market policy options to meso and micro level actors. In other words, policy marketers (actors on the meso-level) define public policy problems, but their available definitions are culturally and institutionally limited by macro-narratives.

The policy marketers as discussed by McBeth and Shanahan (2004) are similar to the previously mentioned discursive marketers of Ontological Security Theory. Combining the NPF with Ontological Security Theory suggests that policy marketers, following a possible focusing event, will utilize narratives of fear in order to either push for policy change or to attempt to keep the status quo. In essence, this is defining and redefining risk within the policy process. Focusing events, by definition, are immense and sudden attacks to the system to the point that existing advocacy coalitions are questionable due to the nature of cognitive disorder. In an effort to prevent ontological insecurity from making the policy area unpredictable, something that neither advocacy coalition would benefit from, advocacy coalitions will first attempt to restore cognitive order through the use of fear. Because of the nature of possible focusing events, these narratives of fear will be institutional and cultural. In other words, in an effort to restore cognitive order following a possible focusing event, advocacy coalitions will use macro-narratives of fear. With all of this in mind, I suggest a Hypothesis 1 in understanding the answer to the second research question concerning the defining and redefining of risk:

Hypothesis 1: In reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order.

Restoring cognitive order is an important part of the policy process following an external event, but it does not negate that actors will still compete for their preferred

policy preference. One of those means of competing is controlling the participation in the policy space. E.E. Schattschneider (1960) famously stated that "the flaw in the pluralist heaven is that the heavenly chorus sings with a strong upper-class accent." In other words, any political system that is predicated upon citizen participation—a pluralist system—will be dominated by those that have the resources to actually partake in it, unless there is an institutional system that allows those with fewer resources to participate. The institutional elements to which Schattschneider (1960) referred were political parties and interest groups, and the mechanism that impacts participation is the scope of conflict.

Scope of conflict refers to "an aspect of the scale of political organization and the extent of political competition" (Schattschneider 1960, p. 20). Schattschneider (1960) argues that every policy and political process has two parts: people at the center and people on the periphery. Given the "contagiousness of conflict" the determining factor of policy and political conflicts is the extent to which the people on the peripheral become involved. In order to win, the peripheral groups need to use the elasticity notion of the "contagiousness of conflict" to carefully expand or contract the scope of conflict based upon whether they perceive themselves as winning or losing. Schattschneider's (1960) notions of the scope of conflict and the contagiousness of conflict was a critique of the popular notion of interest group behavior of the time, pluralism.

One of the notions of pluralism that Schattschneider (1960) critiqued is the idea that political parties are continually looking to increase the size of their support base. Instead, Schattschneider (1960) argued that it is irrational to continue to seek to increase the size of your support base if you believe you are winning, for you will further dilute

the payouts of winning. Instead, what is rational for parties is to seek minimal winning coalitions, or just enough support to ensure victory without diluting any benefits from winning. In other words, if an interest group believes they are winning the conflict over a policy area, they will not expand the scope of conflict but will either keep the status quo or even shrink it (issue containment). If an interest group thinks they are losing, they will expand the scope of conflict by increasing the participation of currently non-aligned interest groups (issue expansion).

McBeth et al. (2007) applied Schattscheider's (1960) scope of conflict notion to the Narrative Policy Framework in an effort to understand policy change. McBeth et al.'s (2007) argument is based upon previous works which state that at any point of time an interest group is either in or out of a minimal winning coalition (Baumgartner and Jones 1993). The exceptions to this are where there exist "wicked problems" (Rittel and Webber 1973) which resist "resolution by appeal to the facts" (Schon and Rein 1994, 4), and where beliefs are formed by cultural norms (Wood and Doan 2003, 641). McBeth et al. (2007) argue that over time interest groups move toward the development of technical expertise through policy learning (Sabatier and Jenkins-Smith 1999, 124). The primary means by which interest groups expand or contract the scope of conflict is policy narratives (McBeth et al. 2007). Policy narratives impact the scope of conflict because they contain primary beliefs, political strategies, and rhetorical devices; all of which are developed over time through policy learning (McBeth et al. 2007) and all of which are used to either attract a bigger support group (issue expansion) or lower the size of the support group (issue contraction).

McBeth et al. (2007), Jones and McBeth (2010), and Shanahan (2013) propose five political strategies utilized by policy coalitions on the meso level: the identification of winners and losers; the construction of benefits and costs; the use of condensation symbols; the use of policy surrogates; and most importantly for this study, the use of scientific certainty and disagreement narratives. Using the last of the five strategies, McBeth et al. (2007, 92) argue that "groups that are winning in a policy issue are likely to define the issue in terms of scientific certainty…ignoring normative issues…in an attempt to maintain the minimum winning coalition." McBeth et al. (2007) based their argument upon Nie's (2003, 323) claim that beliefs in the certainty of science can also cause policy disagreement, especially with environmental policy which Nie argues has become one in which political actors "frame value and interest based political conflict as a scientific one" that allows them to "escape responsibility for making the tough choices required for them."

NPF research on narrative strategies have found support for four of the five strategies, all except for scientific certainty and disagreement (McBeth et. al. 2007). McBeth et al.'s (2007) failure to support the usage of narrative strategies associated with the importance of scientific certainty and disagreement for issue expansion or contraction highlights an important element of science and connects the notion of the scope of conflict with policy narratives of fear on the meso level. Additionally, the element of science highlighted by McBeth et al.'s (2007) finding also connects us back to Stone's comments on rhetorical strategies and Rittel and Webster's (1973) notions of the impact of science and reason on wicked problems mentioned in Chapter 5. In an effort to

understand this element of science, we must first discuss how McBeth et al. (2007) operationalized scientific certainty and disagreement and their specific findings.

McBeth et. al. (2007) operationalized scientific certainty and disagreement as whether the policy narratives found in public documents by the Greater Yellowstone Coalition and Blue Ribbon Coalition from 1997-2004 stated the certainty of the scientific process or questioned the authority of scientific findings. They found that "approximately 50 percent of both winning and losing narratives use science in their narratives, of those, both narrative frames used scientific certainty at high rates, 89.5 and 85.7 percent, respectively." In fact, McBeth et al. (2007) found that both policy coalitions used scientific certainty to back up their policy preferences, the difference is the type of science used. One group used a biological approach while the other a technological approach leading McBeth et al. (2007, 101) to argue that "the conflict over science between competing interest groups is usually a battle over the stable policy core beliefs embedded in the science rather than part of a dynamic narrative political strategy." In other words, the conflict is not over whether science is certain or not but over what exactly science is certain about. McBeth et al.'s (2007) conclusion on the certainty of science leads to the question of whether or not there is an alternative rhetorical strategy to the use of science in policy narratives outside of certainty/uncertainty when dealing with wicked problems. An alternative rhetorical strategy that takes into account the inherent need to maintain ontological security by decreasing fear and the impact of culture factors over reason

In summary, Nie (2003, 323) argues that actors "frame value and interest based political conflict as scientific ones" and "escape responsibility for making the tough

choices required of them." Yet, Rittel and Webber (1973) argue that when dealing with "wicked problems"—including environmental problems as Nie (2003) discussed—rationality and scientific reasoning is minimized and perceptional factors are more important. Wood and Doan (2003) argue that these perception factors are cultural norms. With these in mind, this manuscript adds to the discussion by presenting the argument that macro-narratives of fear are cultural norms that impact the policy process.

Fear and Science, An Alternative Rhetorical Strategy

Being drawn into policy debates can both impact the quality of the research (Pielke Jr. 2007) (Grundmann and Stehr 2012) and public acceptance of scientific findings. In the case of popular reports of scientific findings, conveyed with the explicit purpose of trying to persuade a group including some not trained in the scientific method, science becomes what Stone (2002) refers to as a symbol, or the usage of words to provide explanations for how the world works, in an effort to reduce perceptions of ambiguity.

The aims at the reduction of ambiguity through the usage of science as a symbol is a rhetorical strategy for controlling the level of ontology security within a society. In other words, as Giddens (2006) argues, an external event can lead to the occurrence of ontological insecurity depending upon the prevalence of uncertainty. Science is a rhetorical strategy aimed at reducing ambiguity throughout the policy process. But, if an external event were to occur, like Fukushima-Daiichi, the rhetorical ability of science to prevent ontological insecurity would be limited due to the usage of science to argue that nuclear technologies are safe prior to the incident. This, again as a means to answer the

second research question on defining and redefining risk, leads to two additional hypothesis:

Hypothesis 2a: A rhetorical strategy based upon the certainty of science will be used before and after a focusing event.
Hypothesis 2b: Following a focusing event, macro-narratives of fear will be used to base the certainty of science within cultural norms.

The problem with rhetorical strategies on the certainty of science, is that if they are able to create routinized behavior in an effort to prevent ontological insecurity before a focusing event, their ability to reestablish routinized behavior following a focusing event is limited at best. In other words, if science is so certain, why did it not prevent the accident? On the other hand, the previous routinized behavior cannot be completely done away with, for that may, by itself, create more uncertainty if science is no longer a symbol of complete certainty in the world. In other words, a rhetorical strategy would have to be created in an effort to not challenge the foundation of the certainty of science but to regain public trust in the certainty of science while also explaining why the accident occurred, indicating steps to prevent future accidents, and regaining ontological security.

In order for this new routinized behavior to become affective, it has to become institutionalized. In other words, it has to become a new part of the daily lives of the organization—a new definition of risk. Earlier in this chapter, I theorized the power of fear based policy narratives to temporarily prevent the occurrence of uncertainty following an external event. I concluded that institutionalized change needed to occur. When exactly does an organization switch from temporary fear based narratives to institutionalized routinized behavior, theory does not allow us to currently draw any expectations. All we can do is to state that we expect the institutionalization to occur and

realize that institutionalization does not occur over night, and is dependent on many organizational aspects like culture, rules, and regulations. What we do know is that this new institutionalization reveals another redefining of risk. Thus, again, to help answer the second research question, a third hypothesis is suggested:

Hypothesis 3: A new rhetorical strategy will be established after a focusing event.

Conclusion

This has been a very ambitious chapter, the purpose of which was to build a theoretical understanding of risk based perceptions by combining two large theories/frameworks: ontological security and Narrative Policy Framework. In addition, the chapter went one step further by not only combing two separate theories/frameworks but developing a theoretical understanding of the macro-level of the Narrative Policy Framework. I will do my best to offer a succinct yet accurate summation of this chapter.

The previous chapter argued that risk is perceived and those perceptions are based on numerous factors including self-identity and culture. These risk perceptions are impacted by the politics of fear through the usage of fear based macro-narratives. These macro narratives are formed over time through various processes including interpretive effects that impact the distribution of actual or perceived benefits and costs of policy actions. One possible means of affecting macro-narratives through the interpretive effect is through the use of a narrative strategies like the scope of conflict that seek to increase or decrease the size of the winning coalition and thusly the payouts and costs of policy. Two means of impacting the scope of conflict is through the usage of crises statements and biographical narratives focused on fear based macro-narratives like honor, glory, and hubris.

While this chapter developed the theoretical understanding outlined above, it did not offer any test of it. The rest of this manuscript will do exactly this. Chapter 6 will offer further background of the theory and issue at hand outside of the scope of Chapter 5. Chapter 7 will outline a basic overall research design and argument while Chapter 8 will test the hypotheses developed in this chapter:

Hypothesis 1: In reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order.
Hypothesis 2a: A rhetorical strategy based upon the certainty of science will be used before and after a focusing event.
Hypothesis 2b: Following a focusing event, macro-narratives of fear will be used to base the certainty of science within cultural norms.
Hypothesis 3: A new rhetorical strategy will be established after a focusing event.

Chapter VI: Further Background

Previous sections provided a theory of the impact and the identity of macro-narratives of fear tied to ontological security. This section develops a broad overview of how fear based macro-narratives are identified. I examine the level of analysis, the unit of analysis, and the time frame in order to provide a general background into how this manuscript will examine the impact of macro-narratives of fear on risk-perceptions. The specific macro-narratives of fear was previously discussed and are fully be explored in their respective chapters.

Level of Analysis

I have previously discussed that the Narrative Policy Framework (NPF) theorizes policy narrative via three levels of analyses: micro, meso, and macro. International relations theory also looks at three levels of analysis; however, it argues that politics occurs on the individual, state, and international level (Waltz 1959). Are these merely different names for the same thing or do they represent theoretically different concepts?

The micro-level in the NPF is "best understood as an evolving psychological model of the individual that acknowledges and tests the primacy of affect and narration in human decision-making and cognitive processes" (McBeth et al. 2014). On the other hand, the individual level for Waltz (1959) is best understood as a level of explanation that rests upon the nature of particular statesmen and political leaders or human nature in general. The differences are subtle but important. When the NPF is talking about the "individual," they are not talking about leaders but rather the public, as in public opinion. Furthermore, by the public, they mean the group of individuals outside of government or

interest groups that is affected by or can affect policy. In defining the public as such, size and make-up of the public can change depending upon the scope of the policy.

Research on the meso-level study public policymaking within policy subsystems with the advocacy coalition as the primary actor. The advocacy coalition is defined as a "people from a variety of positions (elected and agency official, interest groups leaders, and researchers) who share a particular belief system" and "who show a non-trivial degree of coordinated activity over time" (Sabatier 1988, 139). In other words, members of the advocacy coalition have a more direct impact on policy outside of being in the in-group or out-group of a collective opinion. They are the elites. The traditional international relations individual level of analysis focuses on individual politicians/leaders and would be well suited within the meso-level of narrative policy studies. However, the meso-level is not equivalent with the state level for the state level is concerned with the domestic make-up of a state or institutional/cultural/normative factors of the state that affects multiple policies over time. In essence, this is similar to a macro approach of the NPF, but I will make that argument below.

Macro-level narratives are "communal, historical narratives that are expansive enough to explain a variety of human events across time and place" (Danforth 2016, 584). In order to understand what a macro-level narrative is, without referring to the previous chapters, it is best to explain what it is not. Both micro-level narratives and meso-level narratives are elements that explain a human event at a particular time and place. A coalition has to be put together for the passage, implementation, and continued funding of a particular policy. The public has an opinion at time "t" about a particular policy and we can measure how that changes over time but only as it applies towards that

particular policy. On the other hand, macro-level narratives are relatively constant and impact numerous policies in general. For example, a macro-level understanding would be the typical international relations focus on the concept of anarchy, but it would not be the current make-up of a specific international level decision body.

Because it is problematic to directly map the levels of analysis of policy narrative studies to that of Waltz (1959), it is important to realize there are two separate conditions and that both sets of conditions are operating simultaneously. Each level of Waltz's (1959) three images have a public (a micro-level), a group of decision-makers (meso-level), and overall institutional/cultural/normative characteristics that affect multiple policies over an extended period of time (macro-level). As such, it is best to think of the levels of analysis in the traditional Waltz (1959) manner but that each level has a macro, meso, and micro sublevel of narratives. This relationship is shown in figure one.

Figure 1: Breakdown of Levels of Analysis

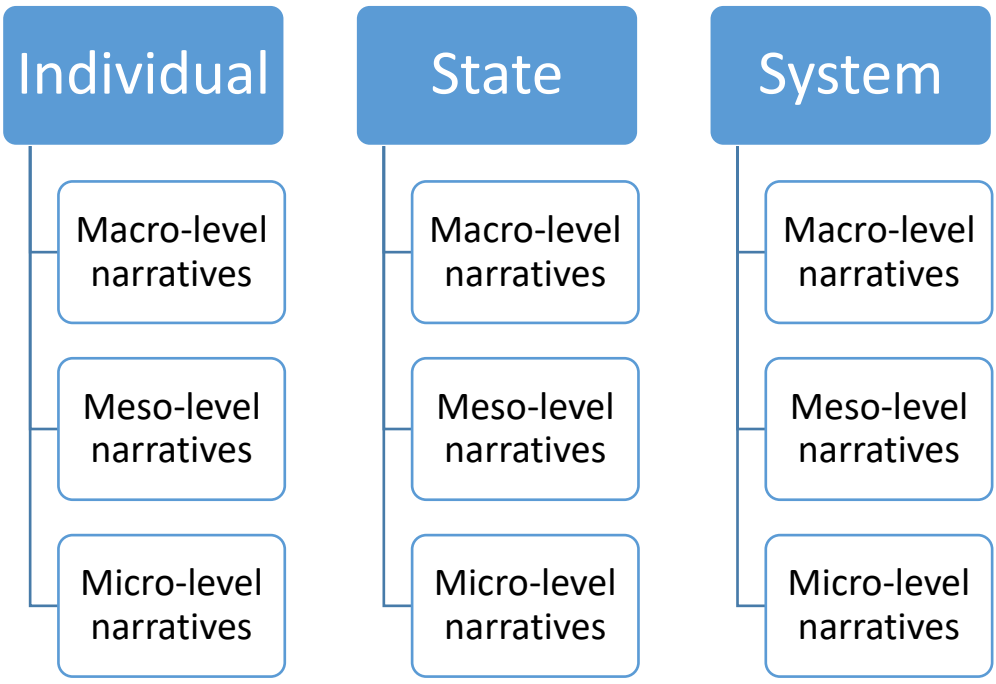


Figure one outlines a theoretical framework of policymaking formed by combining the NPF with Waltz's (1959) images of international relations. As is argued within NPF literature (McBeth et al. 2014), policy is made on the micro, meso, and macro level at the same time. On the other hand, in a growingly global world, policy is also made on the individual, state, and system level. The question remains though, what does the conclusion tell us about nuclear waste management, especially the construction of high-level waste repositories.

Nuclear policy is constructed on the system level by international organizations like the International Nuclear Regulators Association (INRA), the International Atomic Energy Agency (IAEA), the Nuclear Energy Agency (NEA), and unions of states like the European Union (EU). Each of these international organizations has member states, interest groups, academics and other elites that form advocacy coalitions to affect the policy decisions of said international organizations. Lastly, each of these international organizations has a public defined by the territorial scope, issue domain of the organization, and constitutional rules. These publics form opinions based upon policy narratives produced by the advocacy coalitions, narratives limited by macro-narratives.

For the purposes of this study, the research question focuses on decision making within the European Union and as such, the study will rest on the system level. As for the level of analysis according to the NPF, this study will focus on the macro level as argued throughout this paper.

Unit of Analysis

The European Union is currently comprised of 28 countries. Over time, member states have slowly transferred more and more power to the union of states. The main

decision-making body within the EU is the European Parliament which is directly elected from within each EU member state and has the power of passing EU wide laws. The European Council, which is formed by the national heads of state and a rotating EU president, sets the broad priorities of the EU. The interests of the EU as a whole are promoted by the European Commission, whose members are appointed by national governments. The European Commission proposes and implements legislation.

For purposes of this study, the unit of analysis is oral arguments and signing statements made by members of the European Parliament on issues related to nuclear waste management in general. According to the discussion outlined in the previous section, these statements are on the system level. I will look specifically to see whether the stated policy narratives contains macro-narratives of self-identity. These macro-narratives of self-identity and the processes related to empirically indicate their existence are further explained within their specific chapters. The European Parliament makes statements made by Members of Parliament available and easily accessible online for content analysis.

Moment of Interest

The year 2011 is mentioned numerous times within this paper and is listed within the research question, but why is this date important? The European Union passed the *Nuclear Waste and Spent Fuel Management Directive* in 2011. The Directive requires the following of each EU country with nuclear energy capacities:

- "Develop a national policy for spent fuel and nuclear waste management" (Nuclear waste and spent fuel);

- "Draw up and implement national programs for the management of these materials, including the disposal, of all spent nuclear fuel and nuclear waste generated within each country" (Nuclear waste and spent fuel);
- "Put in place a comprehensive and robust framework and competent and independent regulatory body, as well as financing mechanisms to ensure that adequate funds are available" (Nuclear waste and spent fuel);
- "Publish public information on nuclear waste and spent fuel and establish opportunities for public participation" (Nuclear waste and spent fuel);
- "Carry out self-assessments and invite international peer reviews of their national framework, competent authorities and/or national programme at least every ten years (by August 2023)" (Nuclear waste and spent fuel);
- "Exportation of nuclear waste for disposal in countries outside the EU is allowed only under strict conditions" (Nuclear waste and spent fuel).

This directive set in motion a series of discussions on the EU level as well as within each individual country on how to put into place the requirements of the directive as well as on the rationality of nuclear energy. For the purposes of this study, the main element of the Directive is that it mandated that each country with nuclear energy facilities start the research phase of opening a deep geological repository for their high level nuclear waste.

In addition to 2011 being the beginning of the European Union wide policy mandating the construction of deep geological repositories bringing to life the responsibilities of nuclear energy production as well as the reality of stigmatization, the Fukushima-Daiichi nuclear disaster also took place in 2011 bringing to light the second moment of crisis leading to a possible ontological insecurity event. The Fukushima-

Daiichi Nuclear Power Plant was commissioned on March 26, 1971 near Okuma, Fukushima on the Pacific Ocean. A 9.0 M_W earthquake occurred on March 11, 2011 off the Japanese coast sending a tsunami with waves up to 12 meters that went over the protective seawall and entering the nuclear facility. Three of the six units were shut down prior to the incident for maintenance, the remaining three units were immediately shutdown after the earthquake, and generators kept the reactors and spent fuel pools cooled. The tsunami though sent water into the generators disabling them and causing a spiraling heat effect that lead to a partial nuclear meltdown, explosions, and an uncovering of some of the spent fuel pools. The meltdown led to the evacuation of nearby residents and concerns over contaminated food and water from the region and into the Pacific Ocean.

The importance of the Fukushima-Daiichi event coupled with the European Union mandate on nuclear waste management was that the nuclear disaster was not only a disaster concerning the production of nuclear energy like Chernobyl, but it was also an accident concerning the safety of managing the waste of nuclear energy. As such, the year 2011, particularly March 11th will serve as the turning point for this manuscript. It will serve as a natural point of analysis to indicate differences of macro-narratives of fear. Following March 11th, we should see actors utilizing macro-narratives of fear within crisis statements and redefining biographical narratives in hopes of preventing the occurrence of uncertainty in hopes of defining the scope of conflict in a manner that is beneficial for their policy preferences. The next chapters will utilize the background developed in this chapter to examine the impact of macro-narratives of fear on risk perceptions as they related to nuclear waste management.

Chapter VII: Research Design and Application to Nuclear Events

Previous chapters provided a theory of macro-narratives tied to ontological security and laid out a series of hypotheses:

Hypothesis 1: In reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order.
Hypothesis 2a: A rhetorical strategy based upon the certainty of science will be used before and after a focusing event.
Hypothesis 2b: Following a focusing event, macro-narratives of fear will be used to base the certainty of science within cultural norms.
Hypothesis 3: A new rhetorical strategy will be established after a focusing event.

This section will lay out exactly how these hypotheses are tested by first, developing the event; secondly, developing the notion of fear based macro narratives; thirdly, developing a broad overview of how ontological security based narratives will be identified; and lastly, how these narratives will be analyzed.

Defining the Event

Focusing events are defined as an "event that is sudden; relatively uncommon; can be reasonable defined as harmful or revealing the possibility of potentially greater future harms; has harms that are concentrated in a particular geographical area or community of interest; and that is known to policy makers and the public simultaneously" (Birkland 1998, 54). Within the broad category of focusing events exist disasters. Disasters "disrupt the normal, expected workings of society" (Birkland 2013, 365). In other words, disasters question the ontological security of a populace and in doing so leads to need to restore cognitive order. Research on the impact of focusing events have focused on numerous types of events but one of the more common events studied are incidents involving nuclear technology.

There have been over twenty five nuclear events in the history of nuclear energy. The term nuclear event is rather vague for it applies to everything from a momentary core heat-up with no impacts to a reactor explosion that produced long lasting international effects and the deaths of thousands of individuals like the Chernobyl accident. The International Atomic Energy Agency (IAEA) developed the International Nuclear and Radiological Event Scale (INES) in 1990 in order to more systematically portray and report the impact of nuclear events. The INES ranks nuclear incidents between a 0 for a deviation from normal to a 7 representing a major accident. Nuclear incidents are events that rank between a 1 – 3 while nuclear accidents are ranked between 4 and 7. The entire INES ranking is replicated in Table 1 below.

Table 1: INES Ranking of Nuclear Events

		Level	Classification	Examples
Nuclear Events	Nuclear Accidents	7	Major Accident	- Significant release of the radioactive material to the environment resulting in widespread health and environmental effects, Chernobyl, Ukraine, 1986. -Significant release of the radioactive material to the environment resulting in widespread environmental effects, Fukushima, Japan, 2011.
		6	Serious Accident	- Significant release of radioactive material to the environment after the explosion of a high activity waste tank Kyshtym, Russian Federation, 1957.
		5	Accident with Wider Consequences	- Severe damage to the reactor core, NPP Three Mile Island, USA, 1979. - Four people died after being overexposed from an abandoned and ruptured high activity source, Goiania, Brazil, 1987.
		4	Accident with Local Consequences	- Radioactive material in scrap metal facility resulted in acute exposure of scrap dealer, New Delhi, India, 2010. - Overexposure of four workers at an irradiation facility, Stramboliysky, Bulgaria, 2011
	Nuclear Incidents	3	Serious Incident	- Release of Iodine-131 into the environment from the radioelements production facility, Fleurus, Belgium, 2008. - Severe overexposure of a radiographer, Lima, Peru, 2012.
		2	Incident	- Reactor trip due to high pressure in the reactor pressure vessel, NPP Laguna Verde-2, Mexico, 2011. - Overexposure of a practitioner in interventional radiology exceeding the annual limit, Paris, France, 2013.
		1	Anomaly	- Fast stop of the main circulation pumps and simultaneous loss of their fly wheel systems during reactors scram, NPP Olkiluoto-1 Finland, 2008 - Exposure of two workers in the nuclear power plant beyond the dose constraints, NPP Rajasthan-5, India, 2012.
		0	Below Scale	- Discovery of damaged fuel rods during core unloading and fuel inspections, NPP Krsko, Slovenia 2013 - Discovery of consumer goods contaminated with Cobalt-60, Colombo, Sri Lanka, 2012.

Note: Table 1 is a replication of the INES pamphlet and no credit should go to the author for this information. Please refer to the pamphlet for further information (INES).

In the history of nuclear energy, there have been ten nuclear accidents and they are listed in Table 2. The first nuclear accident was the Mayak Production Association accident in Russia in 1957. This nuclear accident is ranked as a 6 on the INES chart

meaning that it is a serious accident. The first nuclear accident in the U.S. was at the National Reactor Testing Station in Idaho Falls, ID in 1961 and is ranked as a 4, an accident with local consequences. The two worst nuclear accidents according to the INES are the 1986 accident at the Chernobyl Nuclear Power Plant in honor of Vladimir Ilyich Lenin in Ukraine and the 2011 accident at the Fukushima Dai-ichi Nuclear power plant in Japan. Both incidents are ranked as a 7 according to the INES and their effects are still being debated and experienced today.

Table 2: History of Nuclear Accidents

Name	Location	Date	INES Rank
Mayak Production Association	Ozyorsk, Chelyabinsk Oblast (Russia)	September 29, 1957	6
Windscale Nuclear Reactor Facility (Sellafield)	Cumbria, United Kingdom	October 10, 1957	5
National Reactor Testing Station	Idaho Falls, ID (USA)	January 3, 1961	4
Lucens Reactor	Vaud, Switzerland	January 21, 1969	5
Bohunice Nuclear Power Plant	Jaslovske` Bohunice, Czechoslovakia	January 5, 1976	4
Bohunice Nuclear Power Plant	Jaslovske` Bohunice, Czechoslovakia	February 22, 1977	4
Three Mile Island Nuclear Generating Station	Middletown, PA (USA)	March 28, 1978	5
Chernobyl Nuclear Power Plant in honor of Vladimir Ilyich Lenin	Pripyat, Ukraine	April 26, 1986	7
Tokaimura Nuclear Power PLant	Ibaraki Prefecture, Japan	September 20, 1999	4
Fukushima Dai-ichi Nuclear Power Plant	Fukushima, Japan	March 11, 2011	7

Note: Table 2 contains a list of historical nuclear accidents. Accidents are defined based upon the International Nuclear and Radiological Event Scale (INES) produced by the International Atomic Energy Agency (IAEA). Nuclear events are ranked from 0 – 7 with each level supposedly representing an incident 10x as severe as the previous level. Nuclear accidents are defined as incidents ranked from 4 to 7. (IAEA)

Hans Blix (1986, 9) writes that "…the Three Mile Island (TMI) accident had a heavy impact on nuclear power. It made many people skeptical of—and some even hateful—toward it." But, Three Mile Island also led to safety programs focusing primarily

on human factors nuclear power plant operation (Blix 1986). This advent of what I will refer to as a safety culture mindset led over time to a gradual switch in public confidence towards a more favorable opinion of nuclear power plants with some countries before Chernobyl occurred even starting the construction of new nuclear power plants (Blix 1986). Chernobyl had a similar effect on the nuclear industry. Public opinion towards nuclear energy decreased temporarily after Chernobyl (Blix 1986) and the construction of new nuclear facilities were stopped, something that did not happen even after Three Mile Island (Csereklyei 2014). But as with Three Mile Island, in the nearly 25 years between Chernobyl and Fukushima, nuclear safety culture was updated and expanded, attitudes towards nuclear energy increased, and nuclear new builds started to occur again, especially in Finland (Kojo and Litmanen 2009). Maybe the most telling sign of the switching roles of nuclear technologies in the minds of the public is that the industry started to not only expand nuclear power production but they also started to work on solutions to the nuclear waste problem, as is evident in Finland (Kojo and Litmanen 2009).

The nuclear renaissance that occurred post Chernobyl due in part to an explanation and evolution of safety culture, rising fossil fuel prices, and the possibility of nuclear energy being a solution for reducing greenhouse gases was severely damaged if not reversed on March 11, 2011, when the Fukushima Dai-ichi Nuclear Power Plant experienced a level 7 nuclear accident. Countries that have historically heavily invested in nuclear energy, i.e. France and Germany, started to pass plans aimed at decreasing the percentage of energy produced by nuclear energy. Countries like the United States stopped their efforts at constructing a high level nuclear waste repository. Countries like Sweden go back and forth between their nuclear energy and nuclear waste management efforts.

Lastly, on the opposing end, you have countries like Finland that is not only building more nuclear power plants post Fukushima than before, they are also on pace to open the first high level nuclear waste repository in the world. Given the diverging reactions, this paper will focus specifically on the Fukushima Dai-ichi Nuclear Power Plant accident and macro narratives of fear before and after the nuclear accident.

Unit of Analysis

The previous section introduced the notion of a nuclear accident and built the argument for why focusing this study on the macro-narratives of fear associated with nuclear technologies pre and post Fukushima is a valid design. What it has not done is define the unit of analysis. This section will do exactly that.

Nuclear technologies is a broad topic consisting of defensive and peaceful usages as well as production and waste. This study focuses on nuclear waste for a myriad of reasons. Nuclear power is considered by much of the public to be "unknown, uncontrollable, and dreaded" (Slovic et al. 1991b, 685). This is a feeling that is replicated when dealing with issues of nuclear waste (Kunreuther et al. 1988) (Slovic et al. 1991). Any topic related to nuclear technologies will be fraught with stigma (Slovic et al. 1991) (Slovic et al. 1994) (Flynn 2003), but the stigma associate with nuclear waste is much greater than nuclear energy (Kunreuther et al. 1988) (Slovic et al. 1991) due in part to the dual negative perceptions of nuclear technologies and the concept of waste or garbage. Many communities simply do not want nuclear technologies in their backyard, a stereotypical Not in My Backyard (NiMBy) response. Given the dual stigma associated with nuclear waste in comparison to nuclear energy or the production of nuclear technologies, nuclear waste is the perfect policy area to test the hypothesis because it

prevents the more conservative or harder case to reject the null hypothesis. In other words, fear should be ever present so any difference, especially one that is noticeably different, is more telling than one in a policy area where fear is not ever present or as highly stigmatized.

In addition, due to the analysis of the research question on the macro-level of the system, the European Union is an appropriate legislative body to analyze. The European Union has over the years integrated and increased the number of countries under a common economic union with legislative controls over transboundary policy arenas. The main decision-making body within the EU is the European Parliament which is directly elected from within each EU member state and has the power of passing EU wide laws. The European Council, which is formed by the national heads of state and a rotating EU president, sets the broad priorities of the EU. The interests of the EU as a whole are promoted by the European Commission, whose members are appointed by national governments. Due to the EU Parliament being directly elected by the people of their respective country, they are the preferred body to analyze due to the democratic nature of narratives as argued in the NPF.

The EU Parliament's role in nuclear energy, including nuclear waste, is defined by the Euratom Treaty. Specifically, the EU Parliaments role is limited to consultation powers and its opinion is non-binding. Despite what some may consider to be limited powers, the European Parliament has pushed for clarity on the distribution of responsibilities amongst the EU institutions and the member states, pushed for increased security measures, and has led the charge to increase safety and environmental protection. In addition, the European Parliament's consultation powers leads to probably their most

important role, they react to each European Commission policy or act through signing statements, public debate, or questions to the European Commission. For this reason in addition to previously listed reasons, the European Parliament is the appropriate body to focus our attention upon.

For purposes of this study, the unit of analysis is public statements made by members of the European Parliament on issues related to nuclear and/or radioactive waste in the form of signing statements, public debates, or questions submitted to the European Commission. These public statements will be collected through a website native search feature using a standard BOOLEAN search phrase ""nuclear waste" OR "radioactive waste"." This will ensure that all retrieved documents contain one or both of the phrases. The content of each statement will first be analyzed to determine if it is a policy narrative as defined by Shanahan et. al. (2016). In short, in order to be classified as a policy narrative, the statement must contain a policy stance and at least one reference to a character. After separating policy narratives from non-policy narratives, the policy narratives will be analyzed to identify whether they contain macro narratives of fear. In an effort to ensure intercoder reliability, the statements will be individually read and coded by two researchers while a third researcher will be assigned to read those statements where there is a disagreement between the first and second coder. Each coder will be given a sample of narratives and a code sheet located in the appendix section for training purposes before they start to code to ensure accuracy and reliability.

The time period for the analysis will be 10 years prior to the Fukushima nuclear accident and one year after the Fukushima nuclear accident. This time frame is valid because it will allow for an extended time period prior to the event to establish a baseline

and it provides enough time after the event to determine whether there has been a change from the baseline. A longer time period post event would not be beneficial. The research question and subsequent hypotheses of this paper is only concerned with whether there was an immediate departure from the status quo post event, it does not discern a permeance of change.

Macro-Narratives of Fear

Fear as referred to in this paper is simply a deviation from an individual's notion of their self that leads to what I am currently calling "irrational" decision making. Fear brings about uncertainty which could lead to ontological insecurity. Macro-narratives of fear are simply cultural and/or institutional narratives that connect policy with an individual's notion of the self. There are two different sets of macro-narratives of fear presented by the literature discussed within this paper. Ontological Security Theory discusses moral/humanitarianism and honor/glory (Steele 2008) while Fettweis' (2013) "pathologies of power" includes fear, honor, glory, and hubris. The main differences are whether or not honor and glory are separate macro-narratives or similar enough to be combined and whether or not moral/humanitarianism is subsequently its own category or included in the others. In order to measure that, we must first discuss how the various categories are defined within the respective theories. Table 3 shows a comparison of the theories and their definitions.

Table 3: Theoretical Breakdown of Macro-narratives of Fear

	Definitions	
	OST	Pathologies of Fear
Fear	Engage in actions that deviate from the self. (Giddens, 1990)	
Moralism/ Humanitarianism	Any action by a state that "advances a moral principle rather than a selfish interest" (Pape and Kaufmann, 1999: p. 633). An aggregate category of rational actions that differentiates itself from traditional IR rational choice expected utility maximization actions.	
Honor	One possible moral action. A duality of internal and external honor (Lebow, 2003). Internal honor is action based upon validity of action to understanding of self-identity. External honor is action based upon validity of action to an understanding of an individual's role in a collective group. (Steele, 2008)	Narratives that define the self in a sense to establish credibility and to establish a baseline to discern threat perception. An attempt to influence future actions of other states. (Fettweis, 2013)
Glory		Narratives that define prestige and competition with others. Narratives that define the relationship of the self with the other. (Fettweis, 2013)
Hubris		Narratives that define capabilities and the ability of the self to accomplish an act. (Fettweis, 2013)

Table 3 shows similarities between what I call macro-narratives of fear and the elements of Ontological Security Theory (Steele 2008) and the Pathologies of Power (Fettweis 2013). In short, in order to maintain ontologically security, the self has to be continually defined/reinforced, the competition between the self and the other has to be continually defined/reinforced, and the notion of capability has to be continually defined/reinforced. In this vein, I will identify three macro-narratives of fear: honor, glory and hubris.

Honor macro narratives of fear are defined as ontologically security seeking narratives of culture and institutions aimed at defining and or reinforcing the collective self of the state. The purpose of honor narratives is to define credibility through what Fettweis

(2013) defines as the credibility imperative. Honor is defined by Fettweis (2013) as the "resolve to respond to provocation or insult." Honor narratives socially construct what a provocation or an insult is and how a state should respond to provocations and insults. It is a credibility imperative because it defines the role of the state (or its leader) as one that protects the honor of the state and its people. A state may engage in an act that is deemed "irrational" solely because not engaging in the act would question the honor of the state. The leader on the international level can also utilize honor based narratives in an attempt to influence future decisions of actors (Fettweis 2013) in a manner close to creating a new macro-narrative. This ability is especially important in democratic societies hoping to start a policy process as long as one related to deep geological repositories. When it comes to this paper, an honor based self-identity macro-narrative is any policy narrative that is intended to influence future behavior of states by supporting the self-identity of the European Union as an entity that has always cared about safety, will always care about safety, and one that is the valid decision-maker on policies dealing with nuclear technologies.

If honor narratives define the credibility imperative, *glory* narratives define the prestige imperative (Fettweis 2013). If there is one imperative that remains consistent across theories of international relations, it is that states compete against one another. What differs between the theories is exactly what states compete over and how important this competition is for the state. Prestige comes from a state "winning," and glory narratives define what states are competing over and how well that state is doing in the competition. In other words, glory narratives define the proverbial battleground, what is winning and who is and who is not winning. For the purposes of this paper, an honor narrative is any

policy narrative that defines what is good behavior or bad behavior of the European Union and its member states when it comes to the risks associated with nuclear technologies.

The last narrative of self-identity in this research project is the role of *hubris*. To put it bluntly, the purpose of hubris narratives is the keep the faith. In order to act, a group of people has to believe that they can (Steele 2008). They have to believe that they have the power and the capabilities in order to accomplish the goals of the policy. Hubris narratives establish and upkeep this belief. Hubris though leads to an overestimation of capabilities making the action more likely, leads to the misjudging of the actions of others, and causes a state to ignore the advice of others that run counter to the beliefs of the state (Fettweis 2013). The power of hubris when it comes to this research project is that it could be an indicator of the failure to build a repository, either that a current attempt is going to fail or that the initial proposal will ultimately fail. In summary, hubris is a last hearted attempt to save what ultimately may be a failed policy. For the purposes of this paper, a hubris narrative is one that discusses whether the European Union has the capability to safely and securely deploy nuclear technologies for effective nuclear waste management.

Method of Analysis

I will first collect all statements made by members of the European Parliament from January 1, 2001 until March 11, 2012. The statements will be collected from the EU Parliament Plenary database of public statements (EU Parliament Plenary). Secondly, the statements will be searched using the search terms "radioactive waste" and "nuclear waste." Those statements that do not contain at least one of the terms anywhere in the text or the title will be removed. Thirdly, the remaining statements will then be evaluated to make sure they are policy narratives based upon the definition of Shanahan et al. (2017),

i.e. must contain at least one character and offer a policy solution. Each policy narrative will then be evaluated to see if they contain macro-level narratives of fear in a manner to ensure intercoder reliability. Lastly, the policy narratives will be grouped into those before March 11, 2001—Fukushima Daichi nuclear accident—and those after.

After coding the data and dividing them into two groups, hypothesis 1 will be tested using a standard comparison of means test. I will compare the average number of policy narratives that contain macro-narrative of fear before the Fukushima Daiichi nuclear accident to the percentage after the accident to see if the average increases. This rather simplistic standard comparison of means test is appropriate given the nature of the data. I did not sample public statements by members of the European Parliament. I instead collected a population of public statements during my time period and the inference of my results will be restricted to the time period of study.

The data set collected to test hypothesis 1 will be used to also test Hypothesis 2a and 2b, with the addition of a variable to identify statements containing science and technology statements. The variable *Science and Technology*, a yes or no dichotomous variable, will be added, indicating whether that statement contains the phrase science and/or technology.

After coding the data and dividing them into pre and post Fukushima-Daiichi nuclear disaster, Hypothesis 1a and 1b were tested using a standard comparison of means test. This is the same method of analysis discussed in the previous chapter and is appropriate given the data being a population of statements instead of being a sample. For a further explanation on the validity of these data, please refer to the previous chapter.

While the previous designs are is appropriate for testing Hypotheses 1, 2a and 2b, it is not appropriate for testing Hypothesis 3. In order to test Hypothesis 3, a new rhetorical strategy is identified, defined, and operationalized and a new unit of analysis will have to be identified due to the limitations of the previous data set.

A New Rhetorical Strategy

If an organization can no longer argue the certainty of science to justify the continuation of a risky policy, like nuclear waste management, due to the occurrence of an external event that, according to science, should not have happened, then the argument for the occurrence of the event and indicator of future attention and fixes must be the implementation of science, the human element of science. One human element of science, developed over time in the nuclear waste management industry as well as the overall nuclear industry, is the notion of safety culture. Safety culture, as a term, was introduced by the International Atomic Energy Agency (IAEA) following the Chernobyl nuclear disaster. Though this was probably the first time that the term safety culture was used publicly by a member of the international nuclear industry, the notion that a lack of an organization's culture of safety being at fault for a nuclear accident is not restricted to a post-Chernobyl world. The U.S. Nuclear Regulatory Commission (NRC) stated, following the Three Mile Island nuclear accident, "the one theme that runs through the conclusions we have reached is that the principal deficiencies in commercial reactor safety today are not hardware problems, they are management problems" (Rogovin, 1980). Since these incidents, research has been devoted towards safety culture to "understand how shared underlying beliefs and values in an organization may help or hinder safe performance" (Morrow et al. 2014, 37).

While there has been ample ink spilt over the years on safety culture in nuclear technologies (see Wahlström 2011; 2018; Wahlström et al. 1994), what is important for this chapter is whether or not the concept of safety culture is used as a rhetorical strategy to create routinized behavior following a nuclear accident to maintain ontological security. The first step to identifying this is to define safety culture and how it is modeled. The IAEA defines safety culture as "that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance" (Safety Reports 1991, 1). Throughout the years, the IAEA has developed two components of safety culture "the first is the necessary framework within an organization and is the responsibility of the management hierarchy. The second is the attitude of staff at all levels in responding and benefiting from the framework." These two concepts comprise three levels of commitment: policy level commitment, manager commitment, and individual commitment. Policy level commitment includes statements of safety policy, management structures, resources, and self-regulation. Managers' commitment includes definition of responsibilities; definition of control and safety practices; qualifications and training; rewards and sanctions; and audit, review, and comparison of policies with other safety cultures. Since developing the term and structure of safety culture, the IAEA has worked to expand the approach to its member countries building an international organization structure predicated on advancing a pro-nuclear policy by preventing nuclear accidents.

The Nuclear Energy Association (NEA), part of the Organization of Economic Cooperation and Development (OECD), expands upon the IAEA's definition—originally

designed for operators at a nuclear power plant—by applying it to regulatory bodies. The NEA has developed six elements of the safety culture of nuclear regulatory bodies: leaders and managers, management systems, interconnectedness, self-reflection, national culture influences, and time.

Leaders "win the hearts and minds" of their employees to push for a common purpose of a safe operating environment while management implements the processes (NEA 2016). Management systems integrate "essential actions concerning safety culture" including but not limited to self-assessments and reviews of safety culture (NEA 2016). Due to the interconnectedness of safety culture, the NEA states that the regulatory body "profoundly impacts the licensee's safety culture and its sense of responsibility for safety" and as such must not just "consider safety culture as a matter of oversight but also as a matter of self-reflection" (NEA 2016).

The elements of the regulatory body that need to be self-reflected upon include the "shared behaviors of the inspectors when doing their oversight work and interacting with the licensee's employees, or the regulations and requirements issued by the regulatory body" (NEA 2016). But the majority of the elements that need self-reflection include cultural elements like attitudes, values, beliefs, and deeply rooted assumptions shared by the regulatory body's employees. In summary, "self-reflection activities of the regulatory body should therefore not be limited to an analysis of daily oversight practices and of regulations, but should also aim at identifying and debating attitudes, values and beliefs held and shared by the regulatory body's employees, in order to assess how they can positively or negatively impact the licensee's safety culture" (NEA 2016, 13).

National culture is an important part of safety culture. The NEA argues that any organization that wants a strong safety culture has to take into account the culture of their organization which is partly impacted by national cultural elements for two reasons. First, "the individuals working in an organization always execute some feature of their national culture (e.g. certain values or social norms) in their work behavior" (NEA 2016, 13). Secondly, "national culture is embedded in the societal structures around nuclear safety (e.g. legislation, education, roles of different stake holders) which may affect the organizations' activities to a great extent" (NEA 2016, 13). These national cultures continue to evolve over time and depend on the history and origins of the countries as well as climate, environment, and globalization. Some of the important elements of national culture also include collectivism vs. individualism and preference for the status quo over innovation or vis versa. The NEA is clear to state that "it is important that characteristics of national culture should not be viewed as an impediment to safety culture but rather as characteristics and cultural strengths to be aware of and to be used and fostered in developing safety culture" (NEA 2016, 13).

The last element that the NEA highlights is the importance of time on safety culture. A central element of nuclear waste management, as discussed in Chapter 4, is the importance of causing no harm to future generations. The NEA states that when it comes to safety culture, "the culture of the regulatory body should create a balance between the importance people give to the past, present, and future. Excessive focus on one of these time frames to the exclusion of other can create problems" (NEA 2016, 14). In summary, "a lack of awareness of past accidents could lead to a certain insouciances; refusal to accept any current risk that could lead to a reduction of future risk may be the

results of an excessive focus on the present and a wish to maintain the status quo; wishful thinking and over confidence can cause the future to be discounted" (NEA 2016, 14).

While the previous paragraphs listed the definitions and the components of safety culture, including the specific elements of what is and what is not safety culture, the important element to take away is that safety culture is all encompassing and representative of daily activities within the organization, and that the concept can serve as a discursive strategy. In other words, safety culture is culturally based and as such shapes macro-level policy narratives as argued throughout this manuscript. In an effort to understand the evolution of safety culture on the international level, we must look at the international organizations for nuclear energy responsible for implementing safety culture.

Two of the primary international organizations for nuclear energy are the International Atomic Energy Agency (IAEA), an organization within the United Nations system, and the Nuclear Energy Agency (NEA), part of the Organization for Economic Cooperation and Development (OECD). The IAEA is an international organization devoted to promoting safe uses of nuclear technology. It bills itself as "the world's central intergovernmental forum for scientific and technical co-operation in the nuclear field" (IAEA) and was established by statue by the United Nations on October 23, 1956. The IAEA's statutory objective is to "…seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world" and "…ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose" (Medium Term Strategy 2018-2023). As such, the IAEA is an agency that cares about the future of

nuclear energy, including waste management, and the narratives surrounding nuclear technologies. Their role on the international level with regards to nuclear technologies has lead them to take a central role in attempts to expand the scope of conflict post-Fukushima.

The second international organization with a substantial role when it comes to nuclear energy and nuclear waste management is the Nuclear Energy Agency (NEA), a part of the Organization for Economic Cooperation and Development (OECD). In 1958, the OECD established what is now called the Nuclear Energy Agency (NEA). The primary objective of the NEA is to promote cooperation among the governments of its participating countries in furthering the development of nuclear power as a safe, environmentally acceptable and economic energy source through numerous manners including but not limited to "encouraging harmonization of national regulatory policies and practices with particular reference to the safety of nuclear installations,…,[and] radioactive waste management" (NEA). Like the IAEA, the NEA is an international organization that has an interest in keeping pro-nuclear policy coalitions together in an effort to advance current nuclear projects including nuclear waste management projects. The NEA's interest, stake, and role in securing pro-nuclear support throughout long running policy phases gives them a central role in any attempts to expand the scope of conflict post-Fukushima.

In order to access the propositions of importance of safety culture in narratives of nuclear technology before and after Fukushima-Daiichi and their increased usage post Fukushima-Daiichi as a means of establishing an alternative rhetorical strategy, I analyzed publicly available annual publications of the IAEA and the NEA to see not only

the emphasis they place on safety culture but also how they narrate safety culture. The IAEA and the NEA, as part of their dual role in promoting the safety of nuclear energy, publish an Annual Report that summarizes and highlights developments over the past year in major areas of each agency's work. The purpose of these annual reports is simply to report on the agencies' yearly activities, mainly consisting of meetings/conferences and what was discussed at these meetings/conferences. As such, these annual reports present a conservative bases of testing the hypotheses for they are not typically driven by policy narratives. Given the role and importance of these annual reports, they present a valid opportunity to access the evolving role of safety culture.

Each annual report from the IAEA and the NEA, from 2001 until 2018, was downloaded. The start date of 2001 was chosen because it allows a ten year time frame prior to Fukushima-Daiichi which provides enough time to detect trends and not just random changes. The 7 year post Fukushima-Daiichi was not chosen, rather it comprises the population of annual reports available for public viewing.

After downloading all annual reports from 2002 until 2018, each annual report was analyzed to access both the presence of the certainty of science in policy narratives and the role of safety culture in policy narratives. First, each document is electronically searched using a native search function for the term "safety culture." The term safety culture is an institutionalized term, meaning that it is an official term with specific meanings and its usage identifies specific activities, which allows for a search for statements using that term being a valid means of identifying statements. Secondly, all statements containing the term safety culture were analyzed to determine which ones contain policy narratives and which ones do not based upon the definition provided by

Shanahan et al. (2013). Lastly, after identifying statements that contain the phrase "safety culture" and are policy narratives, the total number of statements were tracked from 2002 to 2018 to see if there is an increase of safety culture policy narratives post Fukushima-Daiichi compared to prior Fukushima-Daiichi.

Chapter VIII: Results

The previous chapters of this manuscript was devoted to introducing the research questions, exploring the first research question through a review of the literature on public perception of risk, and developing a series of hypotheses to test the second research question asking whether risk is defined and redefined throughout the policy process and if so, how? This chapter will offer the results of the hypotheses tests on the following hypotheses:

Hypothesis 1: In reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order.
Hypothesis 2a: A rhetorical strategy based upon the certainty of science will be used before and after a focusing event.
Hypothesis 2b: Following a focusing event, macro-narratives of fear will be used to base the certainty of science within cultural norms.
Hypothesis 3: A new rhetorical strategy will be established after a focusing event.

There were 333 public statements made by Ministers of Parliament between January 1, 2001 and March 11, 2012. Of the 333 public statements, 288 statements were coded as a policy narrative meaning that they contained at least one character and one policy solution. The 288 statements that were coded as being a policy narrative and contained at least one reference to nuclear waste or radioactive waste covered a wide range of topics including but not limited to funding the decommissioning of the Kzloduy Nuclear Power plant, the shipping of nuclear waste to Russia, exploitation of natural resources in African countries, the anniversary of Chernobyl, the reaction to the Fukushima accident, and the establishment of an EU wide nuclear waste policy.

Each of these 288 policy narratives were coded based upon whether they contained a macro-narrative of fear. There were a total of 170 policy narratives that contained at least one macro-narratives of fear out of the 288 coded policy narratives. Of the 170 policy

narratives that contained at least one macro-narrative of fear, 56 policy narratives contained at least two macro-narratives of fear while 11 contained all three macro-narratives of fear. The most prevalent of the macro-narratives of fear identified in the public statements was honor, 102 total, followed by glory, 79 total, and hubris, 56 total. Table 4 indicates the presence of each of the macro-narratives of fear.

Table 4: Presence of Macro-narratives of Fear

Narrative Strategies	Percentage
Honor	35%
Glory	27%
Hubris	19%

Note: Appendix A includes coding examples.

As indicated in Table 4, each of the macro-level narratives of fear were discovered in the policy narratives on nuclear and/or radioactive waste. While this study has shown that honor, glory, and hubris narratives exist, that is not the question that was asked. In order to determine whether there was an increase in the usage of macro-narratives of fear in policy narratives following the external event of the Fukushima nuclear accident we have to divide the dataset into pre and post Mach 11, 2001, the date of the nuclear accident. Table 5 reports the results of this division of the data.

Table 5: Presence of Macro-narratives of Fear Pre and Post Fukushima

	Prior to Fukushima	Post Fukushima
Fear Narrative Present	90 (38.63%)	80 (80%)
Fear Narrative Absent	143 (61.37%)	20 (20%)
N	233 (100%)	100 (100%)

As is indicated in Table 5, there was a 107% increase in the usage of macro-narratives of fear by members of the European Parliament in the year following the Fukushima nuclear disaster than in the 10 years before the accident. This finding allows me to reject the null hypothesis that macro-narratives of fear are not used after external events and allow me to state that there the impact of macro-narratives post-external events is plausible. But the inferences able to be reached due to this finding are limited as outlined in the design of the research project.

After analyzing statements made by Members of the European Parliament on issues of nuclear waste management from 2001 until 2012, a few outcomes are immediately realized. The first finding is that despite the unit of analysis consisting of public statements made by Members of the European Parliament on issues related to nuclear waste management, a science and technology field, there were relatively few statements that actually used the words science and/or technology, or spoke on the scientific merits of nuclear waste management. Of the 333 statements, 288 were identified a policy narratives. Of the 288 identified policy narratives, only 38 used the term science and/or technology. Of the 38 policy narratives that discussed science and/or technology, 22 are before Fukushima Daichi over a 10 year time span while 16 are post Fukushima Daichi over a one year time span. The majority of the comments not identified as science and/or technology statements discussed issues related to economics, trade, nuclear legacies, and responsibilities of being a member of the European Union.

The second descriptive finding is the presence of policy narratives. It is interesting to note that of the 40 total nuclear waste management statements identified as pertaining to science and/or technology, 38 were identified to be policy narratives. This

further shows the importance of the Narrative Policy Framework to our understanding of science and technology policy.

After identifying science and technology statements, the identified statements were analyzed to determine whether they were pro-science or anti-science. Specifically, the coders looked for whether or not the members of parliament discussed the ability of science at solving our high level nuclear waste problem. Out of the 38 identified policy narratives that discussed science and/or technology, none were coded as being anti-science. This means that no policy narrative specifically questioned the ability of science to solve high level nuclear waste problems. While some policy narratives made statements questioning current scientific knowledge, they all stated a need to devote more funds to understanding nuclear waste management and as such, was not coded as anti-science. The pro-science finding supports McBeth et. al.'s (2007) conclusion that policy coalitions may disagree on what science says or which version of science should be used, they tend to agree that science holds informative power when it comes policy making. This finding holds regardless of the speaker's stance on nuclear waste management. This finding indicates that Hypothesis 2a is plausible.

Lastly, after analyzing policy narratives that mention science and/or technology and comparing them with fear based macro-narratives as determined in the previous chapter, Hypothesis 2b receives some support (see Table 6). The certainty of science throughout the time period analyzed remained a constant rhetorical strategy and it is a rhetorical strategy that was supported with fear based macro-narratives, post Fukushima-Daiichi nuclear disaster. Before Fukushima-Daiichi, 50% of all science and technology based policy narratives on nuclear waste management contained a fear based macro-

narrative while 50% did not. Following the Fukushima-Daiichi nuclear disaster, the percentage of science and technology based policy narratives that contained a fear based macro narrative skyrocketed to 93.75% while the percentage that did not contain a fear based macro-narrative plummeted to 6.25%.

The findings reported in this chapter so far add support to Hypothesis 2b, but mean is a statistic that is greatly exaggerated by low number of observations due to the inability of the data to overcome the pulling effect of possible outliers. While the statistic may be exaggerated, the conclusion is valid due to the fact that the data are the population of statements during that time field that meet the requirements mentioned, furthermore, if you remove the percentage statistic, the finding still stands.

Table 6: Presence of Macro-narratives of Fear Pre and Post Fukushima in Science and Technology Statements

	Prior to Fukushima	Post Fukushima
Fear Narrative Present	11 (50%)	15 (93.75%)
Fear Narrative Absent	11 (50%)	1 (6.25%)
N	22 (100%)	16 (100%)

Despite being able to support the notion that fear based macro-narratives are used to support science and technology policy narratives post an external event, that finding is incomplete because it is unable to answer what happens when science fails. In other words, the same science that indicates that deep geological repositories are safe also indicates that nuclear energy is safe. When a nuclear disaster happens, like Fukushima-Daiichi, that questions the certainty of science, how do you explain what happened while also pushing for a policy solution that relies upon the same scientific certainty? The

previous paragraphs suggested that, at first, fear based macro-narratives can prevent ontological insecurity, but how do you continue a policy process that can take up to 20 years? Specifically, how do you expand the scope of conflict post external event to ensure the continuation of a policy like deep geological repositories?

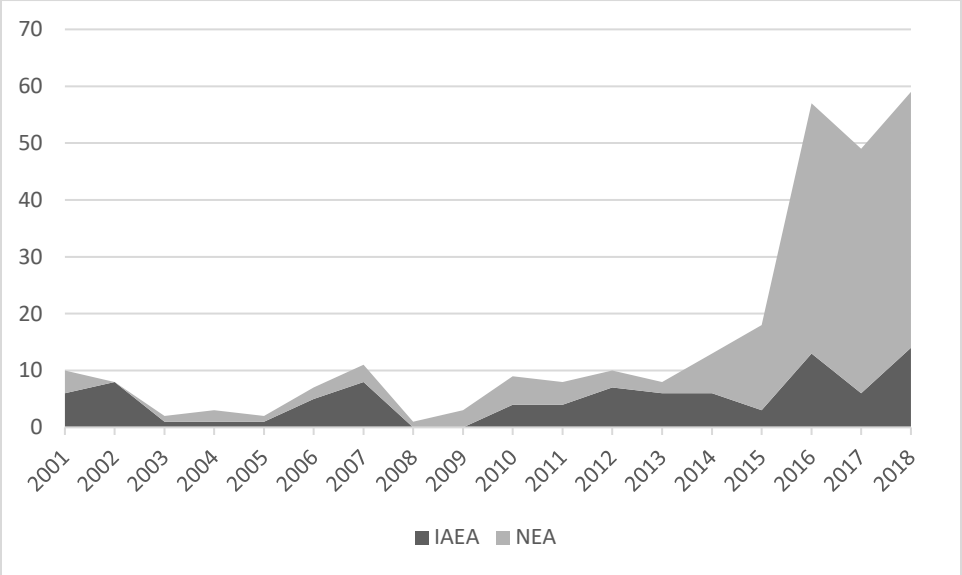
This chapter argues, utilizing the framework developed in this manuscript, that a rhetorical strategy not based upon the certainty of science has to be created in an effort to expand the scope of conflict. Furthermore, if science is not at fault, then it must be the implementation of science, the so-called human element. In order to test this proposition, the annual reports of the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) were analyzed from 2001 until 2018 to determine whether a new rhetorical strategy emerged post-Fukushima-Daiichi related to the human element of science identified as safety culture.

After analyzing the annual reports of the IAEA and the NEA, a few outcomes are immediately realized. As discussed in the research design phase, the annual reports of scientific organizations—even those with public outreach missions—are still very much formalized in their construction and list oriented in their reporting. The nature of the reports makes them very resistant to change over time with many sections replicated over numerous annual reports, especially in the IAEA's annual report. Despite the formalized relatively static format of the annual reports, there was enough variance over time to allow a conservative testing of the hypotheses.

Secondly, the term safety culture has existed in official IAEA and NEA dialogue before and after the Fukushima-Daichi nuclear disaster, as indicated in Figure 2. The continued presence of safety culture throughout the policy cycle studied indicates that

safety culture has been a part of the solution stream. Figure 2 also indicates that Hypothesis 3 may be plausible but in order to come to this conclusion, the data needs to be further explored.

Figure 2: Distribution of Safety Culture Mentions by International Organization 2001 - 2018

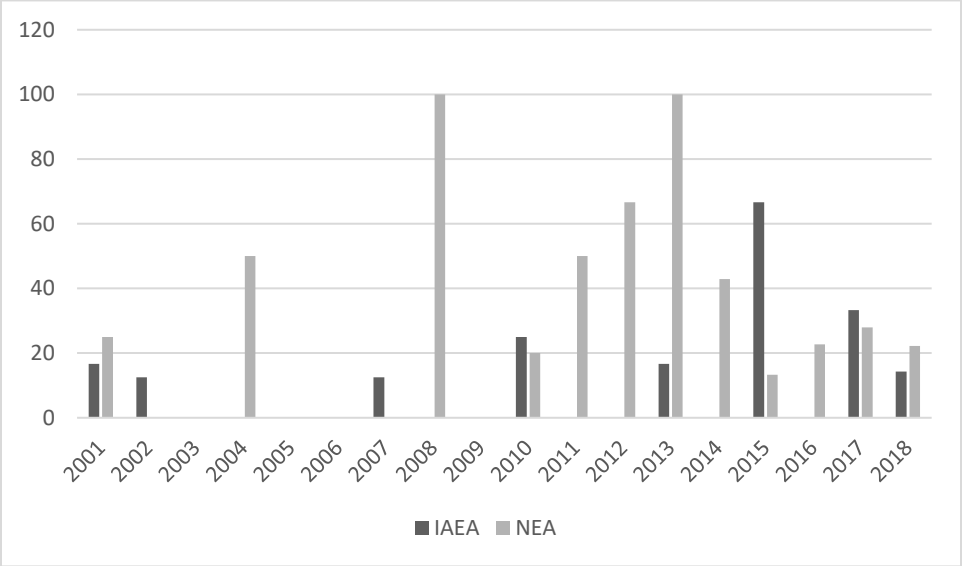


In order to understand the possible evolving nature of safety culture for the IAEA and the NEA, it was necessary to first understand whether safety culture is utilized as a policy narrative, meaning that it contains at least one character and some policy solution. Figure 2 indicates a shear count of the times that safety culture was mentioned while Figure 3 indicates the percentage of statements containing safety culture are also policy narratives. Based upon the results indicated by Figure 3, we can see that despite the NEA in 2004[12] and 2008,[13] the percentage of safety culture statements in the annual reports of

[12] The NEA in 2004 had two total statements that mentioned safety culture in the annual report and one of those statements was a policy narrative.
[13] The NEA in 2008 had one statement that mentioned safety culture in the annual report and it was also a policy narrative.

the IAEA and the NEA that were also policy narratives increased after the Fukushima-Daiichi nuclear disaster in 2011. This lends credence to Hypothesis 3.

Figure 3: Percentage of Policy Narratives Amongst Safety Culture Mentions by International Organization 2001 - 2018



Despite being able to show support for the second hypothesis, this support is constrained by data limitations. As mentioned beforehand, annual reports provide a conservative means of testing a hypothesis concerning institutional change because they report yearly activities not a listing of priorities. As a report of yearly activities, the contents of the reported contents of the annual reports depend upon the international organization changing its day-to-day activities, which for any institution is difficult especially an international organization. As a conservative test, any findings that are received are important but also typically raise more questions for future research. Questions that this finding raises include if the IAEA and the NEA both have similar purposes, similarly benefit from a healthy nuclear waste management policy space, and if a safety culture narrative strategy is a valid means of ensuring a healthy nuclear waste

management policy space following an external event like Fukushima-Daiichi, why is it that the NEA took the lead on institutionalizing safety culture? Are there differences in the two international organizations not mentioned in this chapter or is it simply an outcome of their chosen means of organizing their annual reports? Future research will need to focus on these questions if we are to understand management of the nuclear waste policy space over time.

Conclusion

The purpose of this manuscript is to develop a risk based communication theory on the ability of policy narratives to impact societal level fear through social amplification. Chapters 5 and 6 outlined a framework and Chapter 7 presented the domain to which this study is applied. This chapter tested hypotheses related to the overall purpose of this manuscript. Given the prevalence of ontological insecurity within the policy arena of nuclear waste management due to the dual stigma of nuclear technologies and waste, as expected, macro-narratives of fear was present in public statements throughout. In addition, the usage of macro-narratives of fear increased 107% post-external event. The increase of the presence of macro-narratives of fear post Fukushima indicates at the very least the belief in their ability to shape ontological insecurity by Members of Parliament in the European Union and at the most an indicator of their ability to shape ontological security following an event. The conclusion is probably closer to the first than the second, but the disparity between the two is something that future research will need to ascertain.

What happens when science fails to prevent the occurrence of an event like Fukushima-Daiichi, an event that the certainty of science has been used to argue should not happen? This manuscript explored this question in the realm of nuclear waste

management policy, a policy field that takes up to 20 years from start to finish and one that needs to constantly adjust to the ever evolving policy space. One means of adjusting to an evolving policy space is issue expansion and issue contraction depending upon a groups perceived standing of winning or losing. A means of expanding or contracting issues is through the use of policy narratives. One of the elements of policy narratives that can be used to expand and contract issues is narrative strategies.

I hypothesized and was able to support the claim that actors, both for and against nuclear technologies like deep geological repositories, utilize narrative strategies based upon the certainty of science. I was also able to support the claim that these actors, in their narrative strategies on the certainty of science, used macro-narratives of fear. Lastly, in an effort to answer the question of what happens when science fails, I hypothesized and was able to support the notion of the creation of a new narrative strategy based upon safety culture. All of these are a part of understanding how risk is defined and redefined throughout the policy process.

Despite the advances presented in this chapter, there is much more that needs to be done. One of the more obvious questions to answer is what impact these changes in rhetorical strategies had on deep geological repositories and nuclear energy as a whole post-Fukushima-Daiichi? We know that Finland is the only country that is on the path to completing their deep geological repository anytime within the next 10 years. Sweden has made strides towards and away from starting their repository, and France and Germany have gone away from nuclear energy altogether post-Fukushima-Daiichi. What explains the national level differences? One possible explanation is exactly what versions of safety culture were installed in each national nuclear regulatory regime and

how well it fit with the national cultural element of each nation as mentioned by the NEA in their description of safety culture. This is one area where future research will need to be done. Thankfully, the NEA has started the process of conducting research panels on national cultures and safety culture in its member countries and this body of research should serve researchers well. They have already completed research panels in Sweden and Finland.

Chapter IX: Discussion and Conclusion

There are currently no permanent means of safely disposing high level nuclear waste anywhere in the world. This is a stark fact that both drives my research and one that throughout the writing of this manuscript, I have continually been reminded is widely unknown by anyone who has agreed to listen to me speak about my research. The first response that I typically get after revealing the lack of disposal options is the standard, "why would anyone want to bury nuclear waste in their backyard?" The second standard response is something along the lines of "good, we do not need to dispose of nuclear waste." The third typical response is something along the lines of "nuclear energy is bad and we need to find another means of producing energy." Telling though, one of the least common responses has been "we need to find a solution." These responses further indicate the dual stigma of nuclear waste as being unable to divorce the issue of nuclear waste management from the bigger nuclear energy issue and the large waste management issue.

One line of thought that I have explored throughout my presentations and discussions and one that I now begin any discussion with is that the fact that the necessity of solving the nuclear waste problem does not depend upon our opinion on nuclear energy. In fact, maybe the one step that would most drastically increase the need to solve the high level nuclear waste problem, as it would create the most high level nuclear waste, is moving away from nuclear energy. If an individual disapproves of nuclear energy and would thusly like all nuclear power plants to be decommissioned, the decommissioning process would create tons of nuclear waste including high level nuclear waste over a short time period. High levels of nuclear waste that must be processed and

stored in temporary non optimum storage until a preferred storage solution is realized. If you approve of nuclear energy and thusly would like more nuclear power plants to be commissioned, it goes without saying that more nuclear waste would be created and managed. Lastly, if you are truly agnostic on the issue, let's just assume that you would do not want any more nuclear power plants to be built or decommissioned, then current level of nuclear waste would continue to be created and thusly continue to need to be properly disposed. In short, the need to solve the high level nuclear waste problem does not depend upon one's attitude and/or opinion on nuclear energy. But it does.

Politics impacts all policies and individuals shape their opinion of nuclear waste based upon their opinion of nuclear energy. As argued in this manuscript, nuclear waste is dually stigmatized as both related to nuclear energy and related to waste management. As a dually stigmatized policy area, high level nuclear waste management is associated with the politics of fear. If we are ever going to solve the nuclear waste problem, we will need to increase our understanding of the politics of fear. This manuscript is a first attempt by this author at expanding our understanding of the politics of fear by applying it to high level nuclear waste and should present a foundation for future research opportunities.

The first research question asked in this dissertation was, how does the public perceive risk and nuclear waste? This question was mainly answered in Chapter 4, via the literature review that described what scholars have found about opinions on nuclear waste. In general, the answer to this question is that the public perceives nuclear waste through a traditional Not In My Back Yard (NiMBY) response where the public may be willing to accept the risk of a deep geological repository, they are not willing to accept it

near them due to the stigma associated with both nuclear technologies and waste management.

The second research question asked in this dissertation was, how is risk defined and redefined throughout the policy process? This question is more complex than the first. The manner taken to examine it necessitated creating a framework to use in examining the defining and redefining of risk and asserting three hypotheses concerning what utilization of this framework would reveal. Next, it was necessary to apply this framework to an existing situation, nuclear waste in the European Union, to see what the developed framework revealed. All of this was done within Chapters 4 through 7.

The first part of Chapter 5 developed a theoretical understanding of the politics of fear based upon ontological security and placed that understanding within the growing Narrative Policy Framework. Ontological security provides an understanding of fear based upon the divergence of an event, action, or thought from our perceptions of our self-identity. In summary, if an event causes us to engage in action that is different from our perceived self-identity, we can experience ontological insecurity depending upon the amount of uncertainty we experience. The level of uncertainty can be either increased or decreased through the usage of routines designed to normalize everyday life. These routines differ between and even within countries just like some actions are considered normal in one country but not in another. These differing routines from country to country are culturally and institutionally rooted phenomena.

The understanding of the politics of fear developed in Chapter 5 is placed into the Narrative Policy Frameworks in the second part of Chapter 5 by arguing that policy narratives are used to impact the amount of uncertainty or fear within a society through

highlighting routinized behavior. The routinized behavior identified through Ontological Security Theory is glory, honor, and hubris. In short, to impact the amount of uncertainty within a society, political narratives either connect or disconnect actions with perceived self-identities as associated with how we define what is important to us (glory), what we consider to be proper and improper actions (honor), and whether we think we are capable of an action (hubris). Each of these routines become a rhetorical strategy in the politics of fear.

Routinized behavior as outlined in Chapter 5 becomes an individual in the mirror type of moment where before an individual goes into a job interview, they attempt to overcome fear and uncertainty by telling their self that this a career move that is important to them (glory); that the new possible position is proper and would be valued by their selves, family, and community (honor); and that they have the skills and experience to not only get the job but to do well within it (hubris). This process outlined in Chapter 4 is not only something that individuals go through before an interview, it is something that we all go through every time we engage in an act or idea that brings about fear. In addition, as Ontological Security Theory (Steele 2008) astutely points out, because governmental decision making is made by individuals, this convincing process applies at all levels of government.

The main contribution of Chapter 5 is to not only lay out the argument but to argue that this convincing process is actionable, meaning that it is a part of the policy process that can be utilized in strategic manners to control the amount of uncertainty in a society. Specifically, the actionable element of this convincing process are fear based

policy narratives. In laying out this argument used to answer the second research question on defining and redefining risk, I suggested three hypotheses:

Hypothesis 1: In reaction to a possible focusing event, actors will use macro-narratives of fear in an attempt to restore cognitive order.
Hypothesis 2a: A rhetorical strategy based upon the certainty of science will be used before and after a focusing event.
Hypothesis 2b: Following a focusing event, macro-narratives of fear will be used to base the certainty of science within cultural norms.
Hypothesis 3: A new rhetorical strategy will be established after a focusing event.

These hypotheses are addressed within Chapters 7 and 8. However, prior to working through these hypotheses—in order to be able to work through these hypotheses—it was first necessary to develop a theoretical framework for understanding whether and how risk is defined and redefined throughout the policy process (Chapter 5). Chapters 6 and 7 used the framework from Chapter 5 and the levels of analysis and unit of analysis ideas from Chapter 6 and applied them to narratives of nuclear waste management before and after the Fukushima-Daiichi Nuclear disaster.

The first argument of Chapter 6 was that if policy narratives are able to control the amount of uncertainty within a society then we should see fear based-macro narratives used following an external event like the Fukushima-Daiichi nuclear disaster. This chapter is a first attempt at answering Research Question #2—Is risk defined and redefined throughout the policy process and if so, how—through testing Hypothesis #1 After analyzing the presence of fear based macro-narratives in statements by the Members of the European Parliament before and after the Fukushima-Daiichi nuclear disaster, two main findings were reached at reported in Chapter 7. The first is that macro-narratives of fear were present in statements throughout the study further indicating the continued presence of the politics of fear. The second finding is that

despite their presence throughout the time period studied, this manuscript found that following Fukushima-Daiichi, the occurrence of fear based macro-narratives increased exponentially leading to support for Hypothesis 1.

The finding that fear based policy narratives are continually present throughout the policy cycle and the finding that their usage increases following an external event contributes substantially to the political science literature. Firstly, it reinforces previous literature suggesting their usage in policy discussion and expands their identification to science and technology studies. Secondly, their identification in science and technology studies presents an opportunity to increase our understanding of how societies and individuals process risk. Lastly, finding that the usage of these fear base narratives increase post external events increases our understanding not only how external events impact the policy process but how their impact differs from country to country and individual to individual. In short, it provides an alternative explanation for policy change. Instead of policy change occurring as a direct result of an external event, an external event causes a possible rise in uncertainty and if that uncertainty is not limited through fear based narratives, policy change can occur. This is a finding that can provide a fruitful baseline for future public policy research given the prevalence of theories and frameworks that utilize external events within their understanding of the policy process.

After identifying the usage of macro-narratives of fear following an external event to theoretically impact the level of uncertainty within a society, Chapter 8 further explored Research Question 2 by testing Hypotheses 2a, 2b, and 3. The Narrative Politics Framework argues that policy narratives are used to expand and contract the scope of conflict but that when it comes to the certainty of science, both sides of a policy

debate supports the certainty of science (McBeth et al. 2007). Building off of McBeth et. al's (2007) finding, Chapter 5 first argues that if the overall argument presented in this manuscript is correct and macro-narratives of fear control the amount of uncertainty in a society, then following an external event associated with science and technology policy, then the usage of macro-narratives of fear should be used to control the amount of uncertainty associated with science. This is exactly what was found after looking at public statements by Members of the European Parliament pre and post the Fukushima-Daiichi nuclear disaster (Hypothesis 2a and 2b).

Lastly, if a rhetorical strategy like the certainty of science is utilized to control the amount of uncertainty prior to an external event, then that same rhetorical strategy may not be able to similarly control the amount of uncertainty after an external event. In other words, a new rhetorical strategy may need to be created if you are attempting to expand the scope of conflict. By looking at annual reports of international nuclear organizations before and after the Fukushima-Daiichi nuclear disaster, Chapter 7 was able to report a sharp increase in the usage of a particular rhetorical strategy associated with science and technology policy, safety culture, following Fukushima-Daiichi.

The finding that a new rhetorical strategy needed to be developed post Fukushima-Daiichi (Hypothesis 3) further adds credence to the argument development within this manuscript. Firstly, it further shows that uncertainty is a constant threat to public policy, thus uncertainty constantly needs to be strategically augmented throughout the policy cycle. Secondly, it indicates how certain rhetorical strategies are developed and retired over time. Lastly, it provides a baseline to increase our understanding of how long term policies are managed over time. This is especially important in a policy arena

like high level nuclear waste management that takes around 20 years to construct a high level nuclear waste repository and a repository that has to be successfully managed for practically as long as Earth is in existence or a better method of disposal is invented. Overall, the work in this dissertation has answered the two research questions. The public perceives the risk of nuclear waste differently than do scientists. More specifically, the public fears disasters such as Fukushima-Daiichi and risk is constantly defined and redefined thought the policy process. The defining the redefining is used both to attempt to draw support, to find a new balance, and to re-calibrate to the new, post-focusing event reality. This defining and redefining is done via social amplification and is utilized by both interest groups consisting of the public, and policy-makers themselves.

Despite the progress this manuscript makes towards increasing our understanding of the politics of fear and high level nuclear waste management, the problems and applications extend beyond the current study and application and should provide a basis for future work by this author as well as others.

The main issue that future research will need to pay attention to is what I call the expanded high level nuclear waste problem. Up until this point, the main question has been the construction of a deep geological repository. Now that one will exist, what is next? In other words, is the question solved or does it open up ground for more research. I argue that it is the latter not the former. Without going too far down a rabbit hole of possible questions, the opening up of a deep geological repository for high level nuclear waste allows individuals to now study domestic and international shipping of spent fuel questions, long term relationships between repository and society questions, impact of the closure of the nuclear fuel cycle on nuclear energy questions, questions related to

international trade of nuclear waste, etc… In summary, the politics of fear and nuclear waste management are areas of study that will continue to be theoretically and applicably important in the coming years and one that should be the focus of much research.

Conclusions

While this manuscript has been successful in developing an understanding of the politics of fear based upon policy narratives and using it to increase our understanding of perceived risk of high level nuclear waste management, there is still a lot of work to do. Fear is ever present and many theories have started to take on the task of increasing our understanding of it and its impact on many elements of our society including politics. But we really do not know much about the politics of fear. I would hope that this is an area of research that receives much attention in the coming years, especially its applications to numerous bodies of research. But for now, the below are the main conclusions reached by this manuscript as it relates to the politics of fear, in no particular order:

- The politics of fear is utilized within the policy process through the usage of crises statements and biographical narratives;
- Crises statements and biographical narratives are used to expand or contract the scope of conflict through macro-narratives of fear identified as honor, glory, and hubris statements;
- Following an external event like Fukushima-Daiichi, macro-narratives of fear will be utilized to prevent hard uncertainty and the occurrence of ontological insecurity; and

- Lastly, after an external event, a new biographical narrative will need to be established that ensures the continuation of the reestablished ontological security by connecting a new rhetorical strategy to the self-identity of a country or group of actors.

Despite the advancements of this manuscript, it is limited to the context that it was created. While the presence of fear and the usage of it is universal over time, the specifics of fear and its magnitude is contextual based upon the current time frame and debate. This contextual nature of fear was theorized in this manuscript through the discussion of how macro-narratives are created and reinforced over time, but the specifics of fear will differ if examined at different moments of time. As such, future studies should dive into the historical evolution of the politics of fear in an effort to understand its contextual nature.

Given the contextual nature of the manuscript, the application of the study is limited to the current time frame and current debate. The manuscript develops a theoretical understanding of the politics of fear that can be applied to study other policy areas and time frames but no inferences should be made based upon this study to another issue and/or timeframe. In addition, future research will need to expand the number of coders to increase intercoder reliability. Lastly, future research will need to pay closer attention to linguistic issues on the possible loss of meaning with translated statements. I tried to normalize linguistic differences as much as possible by only look for generalities in speech but even that does not take into account the contextual nature of language across different cultures. Future studies will need to take this into account within the coding phase by employing coders with various linguistic backgrounds.

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Appendix A: Codebook

Instructions:

1) Read each statement and decide if it is a *Policy Narrative* as defined in the definition section.
2) If it is a *Policy Narrative*, please mark the box under *Policy Narrative* with a 1 and move on to the fourth step.
3) If it is NOT a *Policy Narrative,* please mark the box under *Policy Narrative* with a 0 and move on to the next statement.
4) If it is a *Policy Narrative,* please determine if the statement contains a *Glory, Honor,* and/or *Hubris* fear narrative as defined in the definitions below.
5) If it does, please mark the appropriate cell under the appropriate header and move to Step 7. More than one type of fear narrative may exist in each statement.
6) If it does not, please move to the next statement and Step 1.
7) Determine whether the fear narrative resides at the *Macro, Meso,* and/or *Micro* level as defined in the definitions below and mark with a 1 in the appropriate cell. If different fear narratives within the statement reside on different levels of analysis, please include a parenthesized indication of which fear narrative is on which level. For example 1 (honor) or 1 (glory).
8) In the *Note* section, please including any coding notes that you think are needed to describe your thought process in coding the statement.
9) Please move on to the next statement and to Step 1.

Definitions

Policy Narrative – any narrative that contains at least one character and some element of public policy .

- *Characters* within a policy narrative mainly take the form of victims who are harmed, villains who harm, and heroes who provide or promise relief from harm (Shanahan, 2018). Shanahan (2018: p. 176) also lists possible "more nuanced" character types including beneficiaries that benefit from the actions (Weible et al., 2016), allies and opponents (Merry, 2016), and entrepreneurs and charismatic experts (Lawton and Rudd, 2014).
- Some element of public policy: what is the problem, what are the historical actions that led to this problem, and/or what is the proposed solution to the problem.

Honor Fear Statement - as ontologically security seeking narratives of culture and institutions aimed at defining and or reinforcing the collective self of the state. Aimed at establishing credibility for future cooperative behavior. Any policy narrative that is intended to influence future behavior of states by supporting the self-identity of the EU, country, or actor that has always cared about safety, will always care about safety, and one that is the valid decision-maker on policies dealing with nuclear technologies.

Glory Fear Statement - Narratives associated with defining a competitive balance, a good actor is one that _____, a bad actor is one that _____, we should do _____.

Hubris Fear Statement - Narratives associated with capability. European Union/Country/Actor has the capability to safely and securely deploy nuclear technologies for effective nuclear waste management.
Macro Fear Statement – European Union/Europe/the World/Nuclear Technologies
Meso Fear Statement – A specific country
Micro Fear Statement – A specific actor

Appendix B: Coding Sample

Policy Narrative	Code
"..Regrettably, sometimes when we are playing our political games we want to insert various provisions in documents that may be counterproductive. When they joined the European Union, certain Member States brought with them the burden of nuclear power plants that had been imposed on them against their will. The decommissioning of Ignalina Nuclear Power Plant was one of the conditions of Lithuania's accession to the EU. In turn, the European Union made a formal commitment to fund the decommissioning. Above all, this commitment was made by the EU because it would be impossible for a country like Lithuania to fund all the power plant decommissioning work on its own. The decommissioning work includes dealing with spent fuel and radioactive waste. Therefore, calls to place this burden on the shoulders of the Member States concerned would be counterproductive. If Lithuania did not receive the necessary funding, it would be impossible for it to effectively guarantee security. Instead, in the forthcoming financial perspective, the decommissioning of Ignalina Nuclear Power Plant must remain a concern for both Lithuania and the whole of the European Union. " Radvile Morkunaite-Mikuleniene, PPE, Latvia	Honor, Glory, and Hubris
"The tragic events in Fukushima have only served to strengthen the will of Parliament to have a strong clear directive on the export and processing of nuclear waste. The export of nuclear waste to countries outside the EU must be banned, and exports within the EU must be permitted only through bilateral agreements. We also must have stricter rules in order to protect workers, better monitoring and strengthening of the powers of investigation by the competent authorities in order to be able to carry out regular assessments of nuclear safety, enquiries and inspections. At the same time, research into alternatives to deep disposal of waste must be stepped up. The nuclear issue can no longer be dealt with by sidestepping public opinion, which is increasingly unfavourable towards it. We must have a joint policy on renewable energy and develop other sources of energy, without falling back on fossil fuels, while seeking to ensure that we are self-sufficient." Marielle De Sarnez, ALDE, France	Glory
"I supported this Report on the proposal for a directive on the management of spent fuel and radioactive waste. The current directive only covers spent fuel storage facilities directly related to nuclear installations, the current proposal intends to assure safety in the long term of the management of existing and future radioactive waste. It is crucial that we work together to guarantee the highest possible safety	Glory and Hubris

standards. Indeed, many generations to come will remain at risk This Report calls on member states to accept common minimum standards, invest in new technologies and, importantly, to ban nuclear waste export to third countries." Proinsias De Rossa, S&D, Ireland