AMERICAN INDIAN WORLDVIEWS, RISK PERCEPTIONS AND DISASTER PLANNING: AN EXPLORATORY STUDY

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It is commonly assumed that when confronted with an imminent hazard that people will react *rationally*, and prepare for, or at least attempt to avoid, danger from pending disasters. However, this conventional wisdom is not as evident as it appears. People prepare for, react to, or take social action to avoid hazards when they perceive the risk of danger to be threatening enough to warrant action, providing one has the will, insight and resources to do so. However, not all people perceive risks similarly. Risk is perceived differently by different people which affects risk perception and responses to hazards. This dissertation explores the relationships between American Indian worldviews, risk perceptions and disaster planning. To carry out this research 28 American Indians were interviewed. The sample consists of 14 American Indians residing in a rural area on the northern plains and 14 urban American Indians. The results only partially support that worldview is linked to risk perception and subsequent disaster planning. Other factors found to relate to risk perception and disaster planning for this non-representative sample of American Indians include various forms of social vulnerability.
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CHAPTER 1

INTRODUCTION

It is commonly assumed that when confronted with an imminent hazard that people will react rationally, and prepare for, or at least attempt to avoid, danger from pending disasters. However, this conventional wisdom is not as evident as it appears. People prepare for, react to, or take social action to avoid hazards when they perceive the risk of danger to be threatening enough to warrant action, providing one has the will, insight and resources to do so. However, not all people perceive risks similarly. “Risk is perceived differently by different people” (Baxter, Eyles, & Willms, 1992, p. 212) which affects risk perception and responses to hazards (Brenot, Bonnefous, & Marris, 1998). For example, when facing a cyclone ethnic groups in the U.S. are more reluctant to avoid the danger and evacuate (Gaillard et al., 2008; Peacock & Girard, 1997). This is reminiscent of the Thomas Theorem that says that an objective reality does not always matter; it is one’s perceptions that matter, especially in terms of risk. “It is the view of things, rather than the things themselves that influence how humans react” (Khan, Crozier, & Kennedy, 2012, p. 507). Decisions to prepare for hazards and disasters involve trade-offs mediated by differences in perception and how risk is framed within one’s cultural milieu, including one’s affinity towards particular worldviews. For example, in the contested, but well known, low-risk-white-male-effect (Finucane, Slovic, Mertz, Flynn, & Satterfield, 2000), white males tend to perceive less environmental threat to their well-being from various types of risk, environmental hazards and disasters. Although other factors are involved, this has been attributed to white males who tend to have more control in social, political and economic domains of life; the sense of lower perceived risk is apparently due to having more control and socio-economic power in modern Western life than do non-White males. This low-risk-white-
male-effect supports that there is a subset of White males who possess a particular vision of the
world, a worldview that favors trust in institutions and authorities. Clearly, risk is perceived
differentially (Baxter et al., 1992).

Disaster researchers have long known that risk perceptions vary both among and between
race/ethnicity groups (Drabek, 1986; Finucane et al., 2000). However, risk perception research
regarding many indigenous groups is lacking (Fothergill, Maestas, & Darlington, 1999),
especially work reflecting the voice and needs of communities for which disaster planning
efforts are targeted (Rossi, Lipsey, & Freeman, 2004). The limited literature there is on
indigenous risk perceptions originates more from international sources. However, specific data
on American Indian risk perceptions remains sparse. This research project addresses this
deficiency by exploring the relationships between American Indian worldviews and perceptions
of risk, and secondarily how these perceptions influence planning for, and responses to, natural
and technological hazard threats. The identifier “American Indian” is used here because in many
quarters, American Indian is the most common way in which the indigenous peoples of the U.S.
identify themselves. Discussed below are some examples of variation in perceptions of risk,
interpretations of danger, and reactions to imminent disasters, across a range of different
temporal and spatial contexts.

Internationally, due to the high cultural variation among the more than 370 million
indigenous people living in more than 190 nation-states (United Nations Publication, 2010;
World Atlas, 2011), it is expected that both worldviews and perceptions of risk and danger will
vary significantly between cultural groups as well as within them. In other words, just as
worldviews vary across and within culture, so do perceptions of risk associated with hazards and
disasters. Moreover, one’s worldview, in terms of the beliefs, attitudes and judgments,
influences not only interpretations of risk and danger but also effective attitudinal and behavioral responses to it (Tobin et al., 2011). Thus, it is expected that both worldviews (including the framing of danger) and perceptions of risk will vary between individuals, as well as among and between different race/ethnicity groups.

One example is seen in 16th century Spanish colonialist administrators who, building on a worldview rife with Enlightenment ideas of “progress” and control of the natural world, sought to manage the seasonal flood risks in Central America. These actions were based on past experiences of both Spanish Europeans and the Aztecs who preceded them. By the time of European colonization of Central America, many European urban centers had long experienced the dangers of flooding, such as loss of life and property, the spread of disease and economic dislocation, as well other forms of social disorganization. Building on this knowledge, and Aztec examples of constructing dikes to control flooding, the civic-minded inhabitants of colonial Mexico City perceived the flood threat urgent enough to respond. They controlled the waters with public works projects, building canals that shunted overflow waters away from the colonial urban areas. The Spanish spent several years building the desangue, an eight-mile tunnel/trench that conducted water towards the Tula River and on out to the Gulf of Mexico (Hoberman, 1974).

A different response to seasonal flooding, perception of risk and response can be seen in the eastern hemisphere, in Bangladesh. Along the flood prone Ganges–Brahmaputra–Megna river system, 110 million people live on unprotected flood plains and endure the flooding of annual monsoons. Here flooding is not yet controlled in any significant way, although since the late 1980s a long term flood action plan was formulated to address a litany of disaster-related functions (Khan, 2008). The continued flooding in Bangladesh presents a paradox. Although
the monsoon rainfall causes certain and expected damage, many indigenous peoples perceive annual flooding as both good and bad, with the balance depending on the type of deluge, cause and setting (river, rainfall, or flash flooding, tidal, storm surge or urban floods); all have different consequences. In Bangladesh, flash floods and river floods are of highest concern (Khan, 2008). Although the annual monsoon floods cause much property damage, morbidity and mortality, flooding of the river system also benefits the ecosystem and the people living in the region. Through seasonal flooding ecological balance is maintained, due to regular deposition of soil, silt, clay and other alluvium moved by torrents of rain and variation in water levels and flow. Annual monsoon flooding also irrigates, fertilizes and flushes soils, and removes salts and toxins. The flooding also serves to recharge water reservoirs and aquifers for drinking water, and helps to maintain nutrient continuity in soils and agricultural production levels from one year to the next for local peoples, thus ensuring food supplies for the region (Few, 2003). In addition, the river system flooding has provided numerous formal and informal emergent forms of economy to deal with property damage. For example, many generations of laborers have been hired to rebuild communities and clean wastes in residential and work areas contaminated by flood waters (Pelling, 1999). In this example, it seems that in the worldviews of those impacted by the regular flooding, their perceptions of risk and danger, and their variations in response to environmental dangers, are mediated by both the positive and negative perceptions of annual flooding.

There are other examples of differing risk perceptions and responses to hazards. In 2004, an earthquake and tsunami in Indonesia resulted in very different responses by different ethnic groups in the region. The tsunami slammed into the northwest coast of Sumatra, killing over 165,000 Acehnese and Minangkabau people, whereas only 44 deaths were reported on the
neighboring island of Simeulue right near the earthquake epicenter. Overall, in Sumatra the powerful tsunami waves were very destructive, battering 2,500 villages along an 800 kilometer stretch of coastline (Gaillard et al., 2008). Taking a contextual approach to studying disasters (one that relies on variation in cultural, social, economic and political context of the region), provides a wide lens through which we can understand different perceptions of risk, behavior and outcomes. On Simeulue, where there were few deaths, the social context involved a “disaster sub-culture,” which likely contributed to the early and effective response of the population (Gaillard et al., 2008). This is not a sub-culture in the strict sociological sense (an alternative to the mainstream culture), but exists more as an addendum to the dominant culture, and is invoked under particular circumstances (Granot, 1996). On Simeulue, this sub-culture attends a worldview providing particular cultural gear to cope with the tsunami threat. This alternative life-way emerged within a wide range of old, modern and post-modern histories and cultural traits of the Simeuluese peoples. This “gear” includes the close relationship that most Simeuluese people have with the sea; about 85% report feeling culturally very close to the sea (Gaillard et al., 2008, p. 28). Their worldviews and risk perceptions for tsunamis are rooted in oral stories passed down from recent events, such as the 1907 tsunami which killed hundreds of people. More distally, in the language of the Simeuluese peoples there is a word that that conveys the risks of living near the sea, traditionally passed on to following generations. The Simeuluese word, *smong*, describes the precursory signals of the earthquake and the pending arrival of a tsunami. This vocabulary is not simply descriptive; *smong* is a cultural vehicle that carries significant ontological value. The concept is tied to cosmological stories that order the social world and provide epistemological instructions for social constructions of local, environmental knowledges. *Smong* reminds the peoples of Simeulue that signs such as the
quaking of the earth, sea withdrawal, fleeing animals, darkening skies and blasting rumbling sounds, unequivocally signal they should make haste to evacuate to higher ground, taking with them several days of supplies. The value of an indigenous disaster sub-culture was evident. Within the 20 minutes it took for the tsunami to hit the shore of Simeulue, nearly everybody was removed to safety (Gaillard et al., 2008).

In contrast to the early detection and response of the Simeuluese, the Minangkabau peoples in cities such as of Banda Aceh and Meulaboh had no such response to the tsunami. They were caught by the tidal wave and surge. Many unwary people were swallowed by the tidal wave when they went into the withdrawing sea to collect shells and fish. There was no disaster sub-culture in place to inform the population of how they should interpret the environmental change, nor what they should do after the initial earthquake. Historically, the Minangkabau peoples were fairly new to the region and lacked experience with earthquakes, having only settled in Meulaboh in the 1990s. In addition, their ancestors were not in Sumatra during the devastating tsunami of 1907 that killed so many people in Simeulue. Having been spared the devastation experienced by those on Simeulue, the Minangkabau peoples lacked recent stories and traditions to draw on for dealing with an earthquake (Gaillard et al., 2008).

Moreover, Sumatra has been plagued by an epidemic of armed conflict since 1976 by anti-colonialist movements against the Java-based government. This socio-political context has exacerbated the uncertainty of daily life experienced by the already vulnerable Minangkabau peoples. Over time, there has been a conflict-induced removal of much of the population closer to the coast. The high poverty rate, lack of local cultural knowledge about the environment, recent immigration to Sumatra, and the restricted movement of the population during this long period had made the Minangkabau peoples more vulnerable to the ravages of the Tsunami. And
even if the Minangkabau peoples did have a “disaster subculture” like the Simeulue peoples, and were prepared to respond effectively to the tsunami by evacuation, they would still have to deal with the risk of violence if they got caught up in the long standing armed conflict. The Minangkabau peoples were faced with a multiple risks in their socio-political context and worldviews with which the peoples of Simeulue did not have to contend.

A parallel example can be seen in the Western hemisphere in a 2010 earthquake and tsunami off the coast of Chile. In this case, the worldviews and behavioral responses to the impending tsunami differed between local indigenous fishermen and that of the non-indigenous tourists in the area. As in the Simeuluese disaster culture above, indigenous risk perceptions and responses were influenced in Chile by “natural” or learned warning factors and socio-cultural assets that served as prescriptive forms to amplify resilience via interactions at all levels of society. On the night of the Chilean earthquake and tsunami local indigenous fishermen not only felt the magnitude of the earthquake, they could fortunately see the sea levels shift in the light of the full moon. Assessing the intensity of the earthquake was guided by intergenerational knowledge transmitted by elder’s stories that embed the history of hazards and effectual responses in the region. Some stories contain a heuristic rule of thumb that “if an earthquake is so strong you cannot stand up and walk, you must run to the hills” (Marín et al., 2010, p. 4). Thus, knowledge of the environment and the most desirable behavior prescribed was transmitted orally through social networks from the oral traditions of the elders in Chile. Some non-local tourists in the area also benefitted from the elder’s knowledge of past earthquakes and tsunamis, though not directly. Warnings were shared through indigenous social networks, with knowledgeable neighbors who quickly called for immediate evacuation; some local fisherman risked their lives to run to campsites to warn tourists unaware of the pending tsunami (Marín et
al., 2010). The tourists’ environmental awareness resembles that of the Minangkabau peoples in Sumatra who lack a disaster sub-culture embedded people’s lives and memories in the region; without the local knowledge of the fishermen and their interventions the tourists in the Chilean tsunami of 2010 would have been swept away in the tidal waves.

More local and germane to this research, the literature also includes examples of variation in worldviews, risk perceptions and responses to environmental hazards between American Indian tribes. Such variation is not surprising, given the great number and cultural diversity of American Indian nations. Within and between the tribes in the U.S., and those mentioned in this dissertation, it is expected that worldviews, risk perceptions and behavioral responses will vary. Within the U.S., the federal government recognizes more than 565 indigenous, quasi-sovereign Tribal Nations, whose membership speak more than 200 different languages (Fisher & Ball, 2003). The different cultures and language groups present significant cultural variation in values, spiritual beliefs, kinship patterns, socio-economic status and levels of acculturation (Whitbeck, Hoyt, McMorris, Chen, & Stuben, 2001).

To illustrate the large differences in worldviews, risk perceptions and responses to perceived environmental risks, an example involving two American Indian tribes and the siting of nuclear waste storage will suffice. In the 1990s, the Mescalero Apache and the Sac Fox American Indian tribes were approached regarding permission to site monitored retrievable storage (MRS) facilities for nuclear wastes on reservation land. Although the environmental and health risks associated with storing nuclear wastes were obvious, the choice to store the dangerous materials was based on a host of variables. For instance, housing an MRS site can bring financial rewards to American Indian tribes, which have long been in dire need of monetary support. For many, the appeal of financial gain for performing preliminary studies on
community understanding and interest in hosting an MRS site was overshadowed by the political, environmental and ideological subtext of hosting a nuclear waste storage facility. At the highest levels of state government, so strong were the negative associations connected to an MRS site that the “overtures were met with resounding silence on the part of the nation’s governors” (Gowda & Easterling, 2000, pp. 921-922). Bracketed by the idea that noxious facilities are so often placed in areas where poor, rural minority groups lack political power to prevent such siting, or whether neutral market forces drove the MRS siting on to American Indian lands, the perceptions of risk and the results differed between the Mescalero and Sac/Fox Tribes.

The worldviews of many in both the Mescalero and Sac/Fox Tribes are based on a sense of stewardship; balance and harmony with the natural world, with both having a sense of duty to care for the land. However, only the Mescalero Tribe consented to undertake the initial research studies regarding an MRS storage site on their lands. The differing responses may suggest differing worldviews between the two tribes, which have been influenced by their perceptions of risk, trust in governmental authorities and sense of equity. Additionally, both tribes were influenced by the commonly held belief that the nuclear energy endeavor is problematic because atomic forces are seen as sacred and that atom splitting and transmutation of matter is an unwarranted assault on the realm of God (Black Elk & Lyons, 1990).

While many Sac/Fox tribal members felt radiation leaks from the MRS siting would put tribal members at great risk from radiation exposure, many, but not all, of the Mescalero Apache members perceived the risks from the facility to be balanced by their unique ability to manage the risks. The different perceptions of the two tribes stem from very different historical contexts and sense of efficacy in being able to control such strong forces and trust in contracting with
governmental entities. The Mescalero Apache Tribe exists on its original tribal lands and never had to endure the deficits, morbidity and mortality associated with relocation. Moreover, their confidence in their ability to control radioactive wastes has been likely tied to their sense of confidence in their own continued existence and current economic well-being. The Mescalero have had an economy that provides a stable income for the Tribe, an economy based on several successful businesses, such as a luxury hotel and casino, a ski resort, a golf course, a cattle ranch, and a sawmill. The Mescalero have had much economic power compared to many other tribes. As one of their Tribal representatives’ stated, "The Navajos make rugs, the Pueblos make pots, and the Mescaleros make money" (Sachs, 1996, p. 887).

On the other hand, the Sac/Fox did not carry this sense of confidence in their ability to manage such extremely dangerous substances, nor did they trust that any contractual agreements with the government would come to fruition on the part of governmental promises. Their experience and perceptions have stemmed from very different contexts than that of the Mescalero Apache Tribe. For one, the Sac/Fox retain a salient memory of the historical trauma and distrust of the government from having been forced from their traditional homelands onto the Trail of Tears. The Sac/Fox worldview has been somewhat rooted in this experience as well as the trail of broken treaties that the tribe has experienced when dealing with the U.S. government in the past. Additionally, their socioeconomic status has long differed from that of the Mescalero Apache, making self-efficacy and confidence in managing such risks a valuable but fleeting commodity. Even though the MRS siting offer would have given a good deal of money to the Fox/Sac Tribe, sorely needed by the economically strapped tribe, the risks, distrust of the government promises and lack of a sense they could confidently control the atomic forces of the waste material led to a rejection of the siting offer in their tribal lands in Oklahoma.
Although these examples of variation in risk worldview, risk perception and response open the door to studying indigenous risk perception in general, there is still a dearth of data on American Indian risk perceptions in the disaster literature. This is important to address in disaster research because without explanatory baseline data on how American Indians perceive risk, it is simply unknowable how academic and non-academic disaster researchers can partner with American Indian tribes to prepare for disasters, much less how Tribal planning efforts may be integrated with larger emergency management systems. Thus, both worldviews and perceptions of risks held by American Indian groups are critical to research to enhance safety in Indian communities, because these motivate social action and influence disaster planning efforts (Fothergill & Peek, 2004; Tobin et al., 2011). This is important because disaster researchers, planners and policy makers need to know how marginalized groups perceive risks, hazards and disasters in order to minimize losses (Viscusi & Zeckhauser, 2006).

From pre-Colombian and colonial flood risks and control projects in Mexico, to eons of uncontrolled annual flooding in Bangladesh, to differential responses to recent tsunamis in Sumatra and Chile, to dissimilar perceptions of danger regarding storage of radioactive wastes on American Indian reservations, it is clear there is much variation in the social construction of risk perception and responses to hazards. Therefore, in this work I investigated three phenomena, including American Indian worldviews, perceptions of risk for environmental hazards and the influence of worldviews and risk perceptions on disaster planning, in a rural and urban sample of American Indians. To explore this topic, a worldview framework was constructed that distinguishes trends between a dominant Western worldview, and that of an indigenous or American Indian worldview. The findings from using the worldview framework to explore risk perceptions and disaster planning were somewhat mixed. While many of the research
participants who could be said to have a worldview that views time and space through an
indigenous lens (Axis 1 of the framework), and those reporting thinking through an indigenous
type of process thinking containing different types of merit (Axis 2 of the framework), did seem
related to disaster planning, this outcome was much more prevalent for those residing in the rural
reservation than those living in the urban area. Although explaining the world through an
indigenous sense of balance/imbalance (Axis 3 in the framework), having many strong social
networks (Axis 4) and a sense of holism of the connections between humans, nature and the
cosmos (Axis 5), did seem related to risk perceptions and sense of danger in the world for the
research participants, these axes revealed less about disaster planning. However, so many more
of the rural group reported having disaster kits and planning in place than did the urban group
that these axes remain somewhat vague in their link to disaster planning. Moving beyond the
constraints and limitations of the framework, other phenomena noted in these data may influence
disaster planning even more so, or in addition to, worldviews. For example, the impact of social
vulnerability from living in long-term poverty may trump all other factors influencing planning;
without financial capabilities the notion of household or individual disaster planning seems
remote. Other factors were also found to influence disaster planning in the non-representative
sample of rural and urban American Indians. These include the particular hazards and
geography of the respondents, communication about disasters within one’s social network,
household planning efforts, one’s sense of trust in those institutions that deal with disaster
planning, as well as the adaptive capabilities of the respondents themselves. Many of the
respondents reported simultaneously having a “foot-in-2-worlds,” living both in the dominant
Western world and the non-dominant American Indian world. This means that many
respondents operate in a bicultural world in which worldviews, risk perceptions and disaster
planning exist in a mélange of cultural contexts that give them numerous interpretive schemas (Kroll-Smith & Couch, 1987) through which the world can be viewed and acted upon. In order to better understand these findings and to help frame the remaining chapters in this dissertation, a review of the relevant literature regarding worldviews and risk perceptions follows in chapter 2. Methods and data are discussed in chapter 3, the findings in chapter 4, and a final discussion is presented in chapter 5.
CHAPTER 2

LITERATURE REVIEW: WORLDVIEWS AND RISK PERCEPTIONS

Introduction

The purpose of this research project is to explore American Indian worldviews, risk perceptions, and disaster planning. This is important because one’s worldview and perceptions of risk are known to be significant drivers of disaster planning (Tobin et al., 2011; Fothergill & Peek, 2004). However, specific data on American Indian risk perceptions are missing in the disaster literature. This dissertation addresses this deficiency by exploring the relationships between American Indian worldviews, risk perceptions, and disaster planning, and secondarily, how these perceptions may vary between a rural and an urban sample of American Indians. Thus, the goals of this project are: 1) to understand how American Indian worldviews (as per the framework described below) relate to perceptions of hazards, both technological and natural; 2) to investigate the influence of an American Indian worldview on perceptions of risk and interpretations of danger of environmental hazards; and 3) to consider how these views and perceptions of danger influence planning for natural and technological hazard threats. Below, the worldview concept is discussed, and a framework distinguishing between Western and American Indian (or indigenous) worldviews is presented. After the literature on worldviews and the worldview framework are presented, the chapter concludes with a discussion of the relevant literature on risk perceptions in the social sciences.

Worldviews

The variation in response in the flooding, tsunami and radioactive waste storage illustrations in the introduction chapter above depict different interpretations of environmental
risk depending on the unique worldviews of the inhabitants of the different regions. For example, in Bangladesh, flood mitigation is minimal, though their cultural worldview is based on the accurate assessment of flooding benefits, which apparently outweigh risks (Leiserowitz, 2006). In the flooding, tsunami and radioactive waste examples, interpretations of environmental dangers shaped, and were shaped by, the socio-cultural and physical context in which indigenous peoples are sometimes more connected to nature than non-indigenous or non-local peoples. In other words, different worldviews influence risk perceptions differentially (Leiserowitz, 2006).

_Weltanschauung_, the German word for worldview, first appeared in the late 18th century in Immanuel Kant’s _Critique of Judgment_ (Kant, 1987) to describe the sensory perception of the world around us. Kant provided a broad and vague interpretive term, one that is very flexible and which signifies a culturally embedded explanation of the universe, while implying cognition and values and ascribing meaning to the environment (Ashmore, 1966). Although various worldviews are implied in the grand theories of classical sociology from Comte, Spencer, Durkheim, Marx, and Weber and so on, in the modern study of _weltanschauung_, Redfield was one of the first social scientists to employ the use of the term worldview. Redfield’s definition, an “outlook upon the universe that is characteristic of a people” (Redfield, 1952) is as vague as that implied in grand social theories as well. Redfield felt worldview study was best suited to the anthropological idea of “culture” as the most familiar and comprehensive perspective through which worldviews can be distinguished from one another.

Worldviews are important to study in terms of interpreting risk and danger in the world because they encompass more than just beliefs, values, opinions, attitudes and ideology. Worldviews frame the “total essence of human being” (Law, 2008, p. 26) and are based on broad
assumptions regarding the meaning, importance and knowledge about how various aspects of lived experience, and how the world operates, works or functions in daily life (Worldview, 2000). A worldview is usually linked to groups, communities, societies or cultures as a shared phenomenon (Geertz, 1973). However, the specific aspects of any given worldview vary between individuals to the degree which they share, express and become involved in the reproduction of a particular worldview in the context of other people in their own in-group (Worldview, 2000). Worldviews are context specific and influence how a person “thinks, behaves, makes decisions and defines” events within society (Sue, 1978, p. 458), thus worldviews mediate interpretations of risk and danger in terms of environmental hazards. Worldviews tend to become fixed ways of thinking, behaving and making decisions about risk, often becoming institutionalized truths. However, Naugle cites Nietzsche who said, “Truth is that kind of error without which a certain species of living [human beings] cannot exist.” Nonetheless, this research project assumes a constructionist perspective in which, instead of truths, worldviews are conceptualized as social constructions, relative, fictitious reified cultural models of “subjective projections, linguistic customs [and] habituated thinking” (Naugle, 2002, p. 102). Worldviews are thus culture bound phenomena.

Cosmology, Ontology, Epistemology

In the context of culture, a “worldview” is an underused construct which is not always constituted in formal theory (Koltko-Rivera, 2004). Many scholars (Naugle, 2002), from linguistics (Green & Ives, 2009; Greene & Greene, 2009), psychology (Koltoko-Rivera, 2004), counseling (Rybak, Eastin, & Robbins, 2004), public policy (Swanson, 2010), religion (Heflick & Goldenberg, 2012), social work (Probst, 2013), social psychology (Li & Leung, 2012),
anthropology (Kearney, 1975; Kidron, 2012), sociology (Huddart-Kennedy, Beckley, McFarlane, & Nadeau, 2009), and philosophy (Obasi, Flores, & James-Meyers, 2009) have studied the concept of worldviews, providing a common thread across fields of study that a worldview is an all encompassing lens through which a person looks upon and interprets the universe (Law, 2008).

Of the philosophical non-cultural specific constructs through which the exploration of the links between worldviews, risk perceptions and disaster planning could be explored, the most relevant Western philosophical constructs to assess these phenomena include cosmology (the nature of the universe), ontology (the study of being), and epistemology (a theory of knowledge) (Obasi et al., 2009, p. 939). These three constructs are useful in this project because many indigenous peoples hold cosmological creation stories and oral traditions that depict a close relationship between the nature and human actions (Aftandilian, 2011), a relationship that is critical to understanding how American Indians interpret risk and danger in the environment. Cosmology explains and gives meaning to social disorder, problems and distress experienced during periods of uncertainty. In indigenous cosmology, uncertainty and risk are mediated by keeping balance between humans and the natural world through invoking social actions that involve reciprocity; when these are seen as out-of-balance, the perceived risk rises for calamitous, life-threatening natural disasters (Suzuki & Knudtson, 1993). The cosmological aspect of worldviews often guides perceptions and interpretations of the world, and provides instructions for proper actions that should be followed in a given cultural context, such as the appropriate action for disaster planning. Cosmology is an idea that may abstractly explain what and why particular phenomena are dangerous; however, people also have to pragmatically deal with “cosmological dilemmas and concrete problems that provoke distress and require solutions”
(Oliver-Smith & Hoffman, 1999, p. 7). Paradoxically, cosmology provides risk management strategies for when a disaster occurs and meanings for these potential dilemmas by focusing on the many hazard contingencies, but these actions can also increase anxiety due to heightened concentration, focus and concern regarding dangerous hazards (Eckermann, 2006). In terms of hazard-induced uncertainty, cosmology overlaps with ontology.

Ontology, or the study of being, is often neglected in disaster research (Thompson, 1995). However, ontology provides for more than just reasons for being, ontology provides for collective meanings and a shared “definition of the risk situation” (Mileti & Beck, 1975, p. 29), a crucial component for intervening between a stimulus (risk for man-made or natural hazards) and a behavioral response or how a person “should act” (i.e. formulating a disaster plan, or not) (Blumer, 1966, p. 537). Ontology deals with perception of the nature of reality, like whether or not an object exists (Naslund, 2002). Ontology concerns existentialist questions about human existence regarding meaning, purpose and value in life and is relevant to risk and hazard research in terms of the uncertainty that accompanies a disaster. Disasters introduce insecurity and contingency to life, which impacts nearly every facet of one’s life (Thompson, 1995). Disasters not only destabilize social life but also put at risk the stability of worldviews and ontologically informed systems of meaning (Horlick-Jones, 1995). The purpose of exploring the ontological aspects of worldviews is to obtain general analytical categories that social science can use for comparative inquiry, not necessarily to develop theory based on these categories, but to provide ways to communicate about ambiguous topics like worldviews and risk perceptions (Martins, 2009). Understandings regarding the nature of reality are closely tied to what can be perceived (Galko, 2004), such as interpretation of risk associated with an obvious, implied or even an unseen environmental hazard. Moreover, ontology is especially valuable in cross-cultural,
participatory hazard risk research as it provides ways to reveal implicit and hidden knowledge that could prove useful in disaster planning (Xu & Zlatanova, 2007).

Epistemology, or a theory of knowledge, embodies how we understand risk and communicate that information to others (Naslund, 2002). Epistemologies are linked to worldviews in that “every worldview has an epistemology or its own theory of knowledge” (Harala, Smith, Hassel, & Gailfus, 2005, p. 68-69). Each individual in a culture and/or sub-culture interprets risk and communicates danger through their own worldview, a perspective constituted in assumptions originating from its particular epistemological cultural theory of knowledge about environmental risk (Harala et al., 2005). In disaster research epistemology involves attributions and knowledge about hazards by researchers and those experiencing disasters; these shape and give form to theories of knowledge that may lead production of relevant disaster plans. Theories of knowledge (epistemologies) can change over time. For instance, the theory of knowledge about risk and disasters has changed from attributing environmental dangers to deities, the Fates and Prudence, to viewing them as natural processes or man-made hazard events that interface with human induced vulnerabilities or other phenomena that disrupt the social fabric of a society (McEntire, 2001).

Epistemologies have also been used in different times and places in ways that value some knowledges over others, thereby validating positions of dominance of some groups in society (Harala et al., 2005), which, in some cases, leads to increased damage, morbidity and mortality during disasters. Failure to acknowledge the relevance of indigenous planning knowledge (epistemologies) by government or state sponsored programs can exacerbate conditions of marginalized, disadvantaged, racialized groups, such as American Indians, thereby increasing vulnerability to disasters (Howitt, Havnen, & Veland, 2012). However, including indigenous
knowledge in risk perception and disaster planning research may help decrease vulnerability. For example, in the 2004 tsunami in Sumatra mentioned in chapter 1, for those with a disaster sub-culture, traditional knowledge saved lives by enacting social phenomena such as the Simeuluese concept of *smong*. This knowledge informed people about how to react to earthquakes and tsunamis, and was transmitted throughout the population in the form of cultural “legends, songs, lullabies” on the island of Simeulue, thus transferring knowledge informed by a disaster subculture, and reducing risk and saving the lives of many tribal peoples (Nowak, 2006, p. 1).

From the above, it is clear that an exact definition of the term worldview is complicated, elusive and “highly elastic” (Ashmore, 1966, p. 215) which provides culturally biased orienting dispositions. These dispositions are, based on shared beliefs and values that guide the perception of risk beyond the cognition and “mental models” of the individual to include the political, historical, and social contexts of a range of groups (Dake, 1991, p. 62). More specifically, although worldviews are not homogenous phenomena, the *weltanschauung* of a given cultural group provides a specific vision of the world in which there is much cross-cultural variation in conceptions of nature, the self and society (Clifford, 1983; Geertz in Dundes, 1969, p. 53). But a worldview is not always an obvious phenomenon; a view of the social world through one’s own *weltanschauung* is always opaque and unclear because worldviews usually provide an “ideologically tinged” outlook towards the world (Naslund, 2002, p. 323; Habermas & McCumber, 1989). A worldview influences our perceptions of the world, and conversely, our perceptions of the world influence how we frame our particular worldview. From the social science literature on the topic, the key factor in conceptualizing of a worldview is the overriding theme that “they all point to the commonality of a pervasive, underlying association to the core
of a person or groups of people that connects to all areas of life” (Law, 2008, p. 26). These core areas influence how individuals and groups see and interpret the danger and risk associated with the hazards in the world they inhabit. However, in the modern world there are very few isolated indigenous groups that have a pure weltanschuung of their own. Many American Indians, and most of the participants in this research, state that their lives are interwoven with threads of both Western and American Indian worldviews (See the worldviews comparison framework below). Prior to discussing the differences between Western and indigenous worldviews, the underlying components and assumptions of a Western worldview will be presented as the background with which a more indigenous perspective will be contrasted. Although the two worldviews often overlap like Venn diagrams, a good reason to delineate the Western worldview prior to comparison is that it is ubiquitous in the phases of disaster management processes, from mitigation to preparedness, response, and recovery; these are often rooted in the Western scientific worldview that dominates disaster reduction research efforts.

Western Worldviews

A Western worldview is based on Newtonian reductionism, an individualistic perspective of the world, and the assumption that to be rational one must present a sense of lucid and coherent knowing and doing (Cross et al., 2011; Larson, 1991; Limb, Hodge, & Panos, 2008; Rybak et al., 2004; Stransky, 2006; Blackstock, 2011; Suzuki & Knudtson, 1993). This perspective is rooted in pursuing an atomistic self-interest which could lead to both positive and negative consequences. Atomic individualism stems from the Enlightenment and scientific revolution in which the individual is seen as the “basic building block of a society, with society no more than the sum of the individuals of which it is comprised” (Buchholz & Rosenthal, 2005,
On a subjective-objective continuum, a Western worldview is more linked to a type of objective rationality anchored in the natural sciences and the more Positivist notion that an unbiased reality exists, and as such, can be measured utilizing objective methods (Naslund, 2002; Matthews, 2009). The ontology of a Western worldview also establishes individual independence as the primary mode of existence. As a self-sufficient unit, the individual is seen to live in a world in which there are barriers to goals to overcome, fix or eliminate. Thus, a Western worldview requires the individual to conquer or control the situation, nature and the environment. Rational action of this sort pervades the epistemological underpinnings (theory of knowledge) of many modern social institutions of Western culture (Jaeger, 2001). In addition, a key ontological foundation of a Western worldview is that it tends to overvalue development, economic growth and a cornucopia of hyper-consumerism (Dake, 1991) that has left many people with a ruthless lack of an “eco-consciousness” in which some feel alienated, “separate from and superior to the rest of nature” (Grande, 2004).

Benefits that arise from a Western worldview include the generation of new knowledge and attempted objectivity in measuring social phenomenon, promoted by a reductionistic approach to the world (Cross, 1997). Through the reductionistic approach in Western sciences, many advances have been made. For instance, in aeronautical engineering we have travelled to the moon and astronomical measuring instruments have even left the solar system to explore the unknown universe. In genetics, we have begun to unlock the secrets of the human genome. We have explored the atomic world with nuclear fusion and fission. In the area of disaster research the reductionist approach has resulted in easily designed hazard planning, but planning based in the institutional logic of some emergency managers’ expectations that when warned of impending danger, rational people will take measures to avoid hazards. Other positive outcomes
of Newton scientific worldview and reductionism include a lower infant mortality rate and a longer lifespan, less morbidity, and more modern material conveniences and individual accumulation of wealth, which have been mostly relegated to the industrialized world (Grande, 2004).

Yet, even for the material beneficiaries of the Western industrialized world the value of this reductionism falls short. Economic disparity, malnutrition, violence, poverty, environmental degradation and a pervasive sense of anomie, plague both the industrialized and developing regions of the world. Indeed, modern industrialization has not only left society disparate and alienated, it has also left the planet exhausted (Grande, 2004). This uncertainty is based on concrete realities; water tables are dropping at an alarming rate, animal habitats are being destroyed daily, toxicity of the air, water and land, crime and violence are increasing, as well as a laundry list of other environmental problems are the correlates and outcomes of the reductionism of the Western worldview. These have proven the limits and risks involved in constructing the Newtonian worldview; the toxic results serve as canaries in the coal mine and predict destruction if the more dangerous aspects of modern progress continue to be pursued without concern for the environment. Even respected ecologists like Paul Ehrlich and biologists like E.O. Wilson, who have been trained in Western reductionism, suggest that answers to the environmental problems which reductionism has wrought will not be found in simply more of the same worldview. They say that it is our Western worldview which is mostly to blame here; it tends to obscure our view of our relationship to Nature. Instead, authors like Ehrlich and Wilson tend to lean more towards an indigenous perspective, proposing we must foster biophilia, “a love of life” which leads us to rediscover our kinship with animals and plants with which we share the planet (Suzuki & Knudtson, 1993, p. 102).
Other caveats to the Western worldview build on alienation and disconnection from Nature and the belief that by “stripping Nature to its most elementary components we can gain insight that can be fitted together like pieces in an immense jigsaw puzzle to reveal the deepest secrets of the universe” (Suzuki & Knudtson, 1993, p. xxviii). This theme of disconnection from the wholeness of the natural world leaves mainstream hazard management in a quandary in terms of disaster risk reduction for indigenous peoples because it serves as an ontological and epistemological divide between state/federal hazard managers and those of some Tribal groups. Disasters are multifaceted interactions between the human world and the natural environment, and effective risk reduction requires a deep connection to both society and nature. Disaster risk reduction is inherently linked to the natural environment and requires a broad approach involving many sectors of society including land-use planning, environmental management, infrastructure development, construction, agriculture, water resources, public health and social policy (Basher, 2008). Thus, as all of these sectors operate in the environment, lack of connection to the natural world only increases the risk for disasters for indigenous peoples. Lack of understanding of the relationship between indigenous peoples and the natural world impacts mainstream disaster research, many of whom assume those most at risk from dangerous hazards will behave similarly to everyone else. Many hazard researchers think that people will react rationally and prepare for and respond to hazard threats, yet many who are most at risk (who are assumed to have their own legitimate rationality) sometimes “choose not to take protective measures” (Dash & Gladwin, 2007, p. 70). While there are numerous internal differences between and within American Indian tribes, there are also common themes that bind many American Indian peoples together, especially in terms of their relationship with the natural world. Where a purely Western worldview envisions nature as “material, mechanical, and devoid of spirit,” many American
Indians view themselves as connected to the natural world, “as an extended family or society of living, ensouled beings” which provides “foundations for ethical restraint in relation to nonhuman nature” (Callicott, 1982, p. 293). Given that American Indian worldviews are often intertwined with the natural world, it is expected that the American Indians in the research sample would perceive and interpret environmental dangers in ways that protect their cultural identity expressed in an indigenous worldview. However, considering the comments of Ehrlich and Wilson above, and the ongoing effort to bring together the benefits and worldviews of western science and the more nature-based perspectives of indigenous peoples (Suzuki & Knudtson, 1993), it is likely that there would be much ambiguity on how American Indians perceive risk and danger because so many of them occupy and are influenced by two worldviews, Western and indigenous.

Comparison of Western and American Indian Worldviews

The significant cultural variation within and between the more than 560 federally recognized American Indian tribes manifests itself in open debate about whether or not an American Indian (or indigenous) worldview can be distinguished from a Western worldview. However, it is possible to distill common themes that differentiate the two worldviews (Cross, 1997; Deloria, 1992; Duran & Duran, 1995; Red Horse, 1997; Schelbert, 2003). Although there is no “one thing that can be called an American Indian belief system” (Callicott, 1982, p. 293), presented below is a comparative framework of the two worldviews based on several cosmological, ontological and epistemological perspectives drawn from a range of literatures and many American Indian peoples themselves. Like ontology, cosmology and epistemology, the dimensions in the comparative framework below provide ideal types for distinguishing between
the two worldviews. The constructs include how Westerners and American Indians tend to experience, think about, explain and relate to the world, as well as their way of being in the world (Duran & Duran, 1995). The details of each axis of the framework are described below.

A Comparative Worldview Framework

Way of Experiencing the World: Time and Space

The first axis in the framework deals with how people experience the world in terms of time and space. There are significant differences between the ways those with a more Western worldview and those with an indigenous worldview experience the world in terms of time and space (Oliver-Smith & Hoffman, 1999). These differences include the basic emphasis on time versus space, the conception of time as progressive or cyclic, and the conceptualization of space or land as a commodity or an asset. Overall, whereas those with a Western worldview orientation tend to focus on event chronology, an indigenous orientation tends to relate to temporal phenomena more in terms of spatial thinking, but the two phenomena also tend to overlap. For instance, prehistoric Andean culture expressed time in the word *pachacuti*, a combination of “pacha” meaning space or earth or world, and “cuti” meaning a temporal moment, end or alternative (Oliver-Smith & Hoffman, 1999, p. 80).

Instead of the Western focus on when (in linear time) an event occurred, some American Indian peoples tend to focus more on where an event occurred (in space), especially for events and processes that constitute one’s cultural identity. In this mode events are seen as a “function of space,” or where events actually take place (Duran & Duran, 1995, p. 14). The elasticity of time interacts with space. The fluidity and flexibility of Native temporal constructions of space and time dimensions cannot be disentangled, as the two “commingle in various ways” (Munn,
1992, p. 94). In contrast, Western ideas of time hold that time is an atomistic unit, as in instants arrived at in clock minutes, while indigenous peoples often consider time as existing more along a continuum.

Because of difficulties in studying the conceptualization of time in different worldviews there has been lack of rigorous theoretical attention afforded it, with time being relegated to side-bar status, subservient to topics like political structures, descent, ritual, work, narrative history and cosmology (Munn, 1992). However, Western and American Indian ways of experiencing time vary in significant ways that may differentially influence interpretation and response to environmental hazards and dangers. Western thought habitually conceptualizes time as having a linear sequence to history in which there is a clear beginning and an end, but also tends to focus on the future; the advance of western time is seen as a chronological measure of “human progress” (Harala et al., 2005: 68; Duran & Duran, 1995; Suzuki & Knudtson, 1993).

Indigenous peoples tend to experience time as more circular (Rybak et al., 2004; Limb et al., 2008; Cross et al., 2011) or as a “coil-like fusion of circle and line” (Suzuki & Knudtson, 1993, p. 17). For many American Indians, their perception of time is more related to natural cycles through which a good life is maintained only when there is a sense of balance between the individual and the tribe, and between the tribe, nature and the spiritual world (Stransky, 2006; Blackstock, 2011; Greene & Greene, 2009). However, as in the Andean expression of time in the word *pachacuti* mentioned above, many American Indians have been Christianized over the years and they often include and “end-times” scenario in their perceptions of time (Oliver-Smith & Hoffman, 1999, p. 80). Traditionally, many indigenous ontological conceptions of time look both forward and backward to inform the individual how to act in the present. For some American Indians, actions are often thought of in relation to the “impacts of seven generations,”
allowing knowledge from both seven generations in the past and the needs of seven generations in the future, to influence their current worldviews and actions (Blackstock, 2011, p. 7). Thus, perceptions of environmental risks may be informed both by ancestral experiences, current experience and whatever needs and experiences can be predicted in the future, all based on the ontological, cosmological and epistemological foundations of a given tribe.

In terms of American Indian perspectives on “space,” the idea that the land is sacred figures prominently in many American Indian worldviews. While Westernized worldviews tend to promote comodification of the land based on the organizing principle of private property, many American Indians see their cultural identity as tied closely to the land and communal sharing of land. The land is not simply physical space to be speculated upon, bought and sold as any other consumer good, because terra firma is not considered empty space. Instead, American Indian worldviews tend to reify the land as the guiding concern; they hold their lands as having the “highest possible meaning” (Grande, 2004, p. 68). However, in both a Western and American Indian worldview, time and space are interconnected. The Western worldview is more focused on the philosophical concept of linear time in which a Western ontology promotes a transient and secular view of the land as theirs to dominate and reign supreme over, because, as some authors say, their focus on time is often on the prophetic end of time; the fate of time and space are linked. The Western view sees time and space as organized around a grand narrative that sees social change towards that end, which is seen as progress (Grande, 2004, p. 68). For example, Deloria (1992) asserts Western and indigenous cultures differ in their orientations around time and space, with the former, which has been greatly influenced by the Judeo-Christian tradition, conceiving of time as having a precise beginning (symbolically and/or literally in the Garden of Eden) and a prophetic end (Christ’s return and the ‘end of days’). Yet,
Deloria’s comments should be taken with caution; as stated above there is often a mix of Christian and traditional cosmologies enacted in the lives of many American Indians.

Although challenged as an over simplification that the Judeo-Christian cosmology, which informs the Western worldview, seems fatalistic in terms of disaster planning and risk because there is an inevitability to disasters deemed as “God’s will,” this apocalyptic end-of-days phenomena has become a mainstay of popular culture (Bendle, 2005) and is part of the lived experience of most indigenous peoples that have access to mainstream media. Nonetheless, while many indigenous cultures understand time and space as intertwined, their cosmological perspective on the end times does often differ from that of the Western Judeo-Christian tradition, though it is undeniable that there are also many Christianized American Indians who hold similar views. However, in general, many indigenous views of time/space hold cosmological value in terms of cycles of time. In this view everything in the universe is connected and consequential to well-being. Instead of the prophetic fatalistic apocalyptic view of time, many tribal peoples, such as the Hopi and Maya, understand time in terms of prophecy in which “the end” is not necessarily nigh, but reflects a sense of “renewal that will bring a second great flowering of the Americas” (Bastien, 2004, p. 24). Perceiving the future in terms of the “end-times” idea or the concept of a natural end or renewal or even “flowering,” are treated as providing a sense of lack of control over the future of the earth in this study. Whether a person is ambivalent or optimistic about the safety of the environment, perceived risk is also influenced by a host of other vulnerability factors, including race/ethnicity, gender, age, community settlement patterns, historical context, patterns of social interaction and organization, and stratification models that mediate access to resources (Morrow, 1999). These ontological differences between worldviews
may influence how each interprets risk and danger of hazards, depending on the intersection of different forms of social vulnerability with which an individual or a community must contend.

While American Indians experience the land as physical space in practical terms, space/time is also interconnected with symbolic, social and spiritual aspects of their cultures (Wilson, 2003). In contrast to a Western way of experiencing space, many indigenous peoples experience the earth itself through a close sense of connection to the land and see it as inherently holy, not wild, savage and profane “wasteland” (Suzuki & Knudtson, 1993, p. 16). For example, Wilson relates that for the Anishinabek, Ojibwae and Odawa peoples, not only are place and time viewed differently from Western views, but that the land itself is animate; the Earth has a memory that is mediated by the balance between the physical, symbolic, spiritual and social realms of life. For the Anishinabek, balance is critical to maintaining good health. For some indigenous peoples the Earth is a therapeutic landscape (Wilson, 2003) in which balance between human behavior and the environment must be maintained in order to lower the risk of cataclysmic disasters. While many American Indians see an inherent link between the land and the sacred that shapes the epistemological background of Native social systems, from a Western worldview this is nearly indecipherable (Grande, 2004). For example, some Native communities use controlled or prescribed burns of forested areas to inhibit buildup of undergrowth as it increases risk for wildfire because it provides a highly combustible fuel source to feed wildfires. Reducing fuel loads protects significant cultural resources such as burial and ceremonial sites and also allows the vegetation to regenerate. Prescribed burning also controls diseases and threats from insect populations and improves animal habitat. However, for non-Indians who hold a Western way of experiencing space, the American Indian connection to and stewardship of land resources can run counter to those who view prescribed burning as having negative
impacts on private property values, harvestable natural resources, air quality and scenic beauty (Bright et al., 2007). Thus, a disconnect from nature and the land for those with a strict Westernized worldview, can heighten risks of wildfire conflagration if undergrowth goes unattended. Given the perceived lack of political power of American Indians to protect and maintain their sovereignty and what takes place on Indian land, it is not surprising that some would feel a sense of ambivalence, begrudging acceptance or outright fatalism about the ultimate fate of the environment. Ambivalence regarding risk and danger may inhibit action (Weigert, 1989), such as disaster planning. However, this ambivalence is not to be confused with overt fatalism as social pathology in which individuals completely lack a sense of control in their lives, but is more aligned with expressing a sense of knowing that fits well within the ontological, cosmological and epistemological expressions of indigenous worldviews.

Approach to Thinking about the World: Content and Process

There are differences between Western and indigenous worldviews regarding how people think in terms of content or process thinking. As a social science endeavor, a focus on thinking about the world is fair game for scrutiny because thinking is a serious social act itself. Thinking is what Clifford Geertz called “the most consequential of social acts” (Geertz, 1968, p. 139). According to some American Indian scholars, Western and indigenous worldviews tend to influence how individuals approach thinking about the world. In a Western worldview, the focus tends to be on the content of what a person thinks about and promotes thinking based on subject-object relations embedded in that content. However, for many American Indians the focus tends to be more on the process by which a person comes to think about a particular thing or phenomena; this is a systemic approach to thinking that can be termed “process” thinking.
Process thinking can be depicted as having more action in its conception than does the Western way of thinking, and it accompanies many of the processes of daily life for many American Indians, some processes are secular and others are more spiritual. Process thinking has been described as an “eventing” approach to life (Duran and Duran, 1995, p. 15). In a more Western worldview, thinking about knowledge in the world is rooted in the rationalist and empiricist traditions. In this vein, the content of any sort of knowledge is considered to be objectively knowable, “just waiting for the trained observer to discover it” (Topping, Crowell, & Kobayashi, 1989, p. 34). The goal of Western thinking is to make concrete assessments of the content of reality that hold true over time and space, which requires reduction of phenomena to their subparts in order to seek causal mechanistic explanations regarding any phenomena. This is more tied to societies which place more value on literacy in which the written record is paramount, thus placing much value on the past documentation of reality.

However, in an American Indian worldview, knowledge about the world is more often thought of in terms of process, rather than the content to be defined. For some American Indians, epistemological knowledge is often created, recreated and transferred inter-generationally by oral tradition (in addition to written documentation). For indigenous peoples, the observer assumes a more active role in epistemic knowledge creation. Thinking about reality, interpretations and meanings result from the process of interaction “between the knower and the known,” which are based on social interaction and holistic observation of the interface between human culture and the natural environment. In this worldview, thinking is based not only on the processes of traditional oral story-telling, but also on the legitimacy of belief practices that are often experienced through ceremonial processes where knowing is linked to “close, empathetic, communal identification with the known” (Topping et al., 1989, p. 34).
Processes are always in a state of flux where the present continuously shifts between what has shaped one’s thinking in the past, and the pragmatic concerns of the present. Ceremonial processes of American Indians are important belief practices because they provide a sense of legitimated ordering as a community activity (Cajete, 2005). Ceremonial processes can also serve as vectors of change and provide productive processes to find answers to problems such as new ways to cope with ancient environmental hazards. For example, Victor Turner (Turner, 1974) estimated culture to be like a performance, in which individuals are operators of social processes, like in a theater play in which the players act out different rites of passage in ritual and ceremonial processes. In these social contexts aspects of identity are negotiated in public performance, allowing for personal transformation in connection with conflict resolution, and providing spaces in which status, roles and identity can change over time. The metaphor here is movement in which identity is not static, but an emergent aspect of salient culture. Process thinking “involves considering phenomena dynamically – in terms of movement, activity, events, change and temporal evolution” (Langley, 2007, p. 1). In terms of connecting the individual to the community in ceremonial processes, Turner described some positive attributes of ceremonial processes that can promote culturally adaptive ways of thinking and acting. Turner focused on the experiential zone between the crisis and the redressive stages of public performance, which has liminal qualities as a “threshold between … stable phases of the social process” (Turner, 1974, p. 39). In ceremonial processes, group liminality or communitas of the eventing of ceremony can temporarily dissolve social structure, creating a structure/anti-structure rift in the fabric of social relations and hierarchy. Difference and status amongst participants involved in belief practices of ceremony can become nil, and this is where communitas arises, “where social structure is not” (Turner, 1969, p.126). This structure/anti-structure paradox provides a
dialectical relationship between ritual and structure and is fertile ground from which creative responses to threats, such as potential hazards, can emerge.

However, as with space and time above, content and process thinking are not mutually exclusive, and when decisions about interpretations of environmental danger and disaster planning are needed, both must be addressed because content and process are part of the same continuum. They are critical aspects of social processes and building and maintaining legitimacy in terms of the tribal culture in which one is enmeshed. DuFour (2004), a Lakota/Nakota American Indian trained in philosophy at Yale University, alludes to the distinction between content and process thinking by explaining how the process of doing ceremonies places epistemic knowledge in a moral context. DuFour distinguishes between belief practices that have “content merit” in which the belief is acceptable as an epistemological foundation for action (or inaction) if it has face value, if it is “reasonable, relevant or sufficient to the situation at hand,” and “state merit,” or ethical acceptability of how one came to understand, know, or believe something” (DuFour, 2004, p. 36). In process thinking, or gaining state merit (ethical acceptability), the important factor is the process by which a person or group comes to hold a given perspective. While these two types of merit (content and state) can interact with each other, the important thing about both content and state merit in process thinking is that they are often connected to social practices of the group or community, rather than the content of disconnected and biased status of a particular content. For example, an emergency manager may believe that the risk perceptions for hazards in American Indian communities are not important to study because Indian risk perceptions for hazards such as wildfires or nuclear waste should be the same as any other group. This statement motivates one to morally assess this stance or belief because of the potential negative consequences that a homogenous approach to disaster planning
could have on the Indian community in question. The one-size-fits-all approach to disaster planning lacks both content and state merit in that it is not reasonable, sufficient or relevant in terms of the truth it holds because it is rooted in an a priori assumption that all people are the same in terms of risk perceptions- something not supported by the literature on risk perceptions. The stance that Indian risk perceptions should be the same as everyone else in a given area also lacks state merit, in that without supporting evidence, the position has likely been arrived at through a process based on prejudice or having only assumptions prior to investigation, which is morally unacceptable (DuFour, 2004).

State merit, or the legitimacy of the process by which a person comes to hold a belief or practice as valuable, is often connected to systemic processes that “embody an amalgamation of ethical and epistemological concerns,” such as Native ceremonies like the Sun Dance or seeking advice from tribal elders (DuFour, 2004, p. 36). For many American Indians, ceremonies or the words of elders convey important information about individual behavior and the environment. The notions of hazards and risks in a given environmental context are often part of social practices that include ethical and epistemological concerns of the community in which ceremonial and non-ceremonial social interactions or “belief practices” (processes) explicitly and implicitly convey “principles, rules, customs, considerations or instructions” regarding correct social action (DuFour, 2004, p. 36). For instance, a Dakota traditionalist may frequently say in ceremonial life or in everyday conversation “never leave the fire unattended.” This admonition likely contains valid state merit as it is something that is repeatedly supported by the process through which it is conveyed, and is derived from cosmological oral traditions that could translate this statement into the ethical idea that one should constantly attend to the needs of the community. It also interacts with content merit as it is reasonable, sufficient and relevant in
terms of the truth it holds regarding the safety concerns of preventing dangerous wildfires that can quickly cause a wildfire when flames are left unattended.

The concepts of content and state merit, when considered together as part of a larger continuum, provide a process of “definition between event and the behavior formed in response to those events” through which phenomena like risk and disasters are nested within “interpretive schemes” (Kroll-Smith & Couch, 1987, p. 26). These framings allow for both the face-value of content merit, as well as the ethical acceptability of state merit derived from process thinking. More importantly, both content and process thinking are part of a holistic understanding of risk, which has implications for disaster planning. Utilizing solely a Western mode of thinking and disaster planning in Indian country, where content thinking prevails, “the plan” is usually seen as product, whereas in an indigenous perspective disaster planning is often seen as a process of relationship building (Stransky, 2006); both are required for best practices in hazards, risk and disaster research in American Indian communities.

Thinking is social and influenced by norms, mores, values. It is assumed that achieving the legitimacy of one’s worldview involves having a sense of both content and state merit in one’s cultural beliefs and in social practices (spiritual/secular processes/ceremonies). Achieving the legitimacy in process thinking requires using a normative sense of critical thinking (Bailin & Siegel, 2003, p. 181). It is assumed that this normative aspect of truth-seeking in relation to one’s worldview would likely transfer into more rigorous critical thinking in other aspects of one’s life, such as increased hazard awareness and disaster planning.

Way of Explaining the World: Cause and Effect and Balance

In a Western perspective, the world is often explained in terms of the scientific method
approach to cause and effect. A Western epistemology tends to frame explanations of the world through positivism, which focuses on experimental control, external validity, reliability and objectivity (Harala et al., 2005) and the development of technology. The goal of a western scientific approach to the natural world and the uncertainty associated with environmental risks is to “make sense of” the phenomena through tabulating the properties of the things and processes of the natural world in order to “ascertain how causal mechanisms in the world operate” (Matthews, 2009, p. 649), as in the reductionism mentioned above. Instead of explaining the world as an array of static objects in a Western sense, American Indian explanations of the world are more grounded in humanity, subjectivity and relationship building (Harala et al., 2005) and they tend to see the universe as always in motion; nature is a source of dynamic, ever-changing forces in which homeostasis between humanity and the natural world is critical (Stransky, 2006).

Rather than limiting explanations of phenomena in the world to causal mechanisms, an indigenous worldview can also explain the world more based on the idea of “balance” in the relationships between the components of an ever-changing universe. For example, while an American Indian worldview may consider placing a root cause of disasters in man-made environmental conditions, such as poor land use patterns, housing construction and residential development in flood plains or near dangerous and hazardous industries, indigenous peoples sometimes consider disasters as the result of imbalance between humanity and the natural world. This is important in disaster research in Indian communities because these ways of explaining the world include worldview ideas and beliefs that can influence indigenous perceptions of risk and responses to hazards. However, the indigenous value placed on cosmological balance often
exists in opposition to homogenous forms of Western disaster planning (Stransky, 2006, p. 14), which can lead to barriers in cross-cultural disaster research.

Westernized culture is strongly anthropocentric and sets man over and above nature, which in political economy terms encourages dominion and control over the uncertainty of nature for personal and economic gain (Stransky, 2006; Suzuki & Knudtson, 1993). Historically, the optimistic and successful expansion of European influence during the age of exploration, colonization and exploitation served to buttress this sense of dominance toward nature (Catton & Dunlap, 1980, p. 16). The age of European influence and abundance that came with colonization was intermixed with a worldview that held four key ideas that differ from an indigenous worldview; 1) People are fundamentally different from other creatures over which they have dominion, 2) People are masters of their own destiny, 3) The world is vast and has unlimited natural resources, and 4) The control and domination over the natural world through advances in science influences the epistemological framing of technological progress as wholly beneficial to humanity, as a causal mechanism that explains the world (Catton & Dunlap, 1980) From this vantage, risk perception, danger and disasters exist in an objective reality, and as such, can be studied using research procedures from the natural sciences in order to explain the world. Through these methods, the uses of Western scientific technology and progress are geared towards seeking verifiable analyses of causal relationships between variables (Naslund, 2002).

In contrast, in an indigenous way of explaining the world some American Indians do not tend to see themselves as different from other living and inanimate things of this world, but rather some say they see themselves as just one small part of a living and dynamic web of nature in which resources are limited and must not be abused or taken-for-granted. Where the dominant social paradigm of the western worldview is equated with intrinsically good technological
“progress,” the phenomena has a down side; increasing risks for environmental hazards accompany technological and industrial development (Beck, 1992). For many American Indian communities, resource exploitation is not explained in terms of the benefits of technological progress, thus progress is frequently resisted to the extent it threatens tribal core traditions, the land or the natural world on which core traditions are structured (Dyer, 1993). Due to more affinity towards an egalitarian relationship with the natural world for many American Indians, the ideas of control and dominion over nature are less valued than in the Western worldview.

The importance of balance and parity in relationship between and among all things in nature for many indigenous groups is evident in the cosmological views of some. For example, to the Gitksan and Westsuwetan Indigenous peoples of British Columbia, human beings are just one part of “vast, multilayered, cosmic whorl of life cycles; the natural world emerges as an unbroken continuum between humans, animals and the spirit world” (Suzuki & Knudtson, 1993, p. 189). For these indigenous peoples, their ways of explaining the world meshes with their sense of time, which is seen as circular and influences explanations of hazards in the natural world as noted in many indigenous oral traditions. Instead of the linear perspective of the dominant Western worldview in which western history is seen as a “progressive unfolding of causally linked events and achievements,” (Suzuki & Knudtson, 1993, p. 189) the indigenous circular notion of cause and effect is reflected in their ontological observations of seasonal changes in nature. The Gitksan and Westsuwetan peoples perceive environmental risk with a gaze back towards environmental knowledge and codes of conduct of their ancestors regarding hazards that inform safety measures in place today. And they look forward to environmental impacts on future generations. Time is perceived differently for the Gitksan and Westsuwetan
peoples who see the past as not simply constituted in simple linear history but directly affecting both the present and the future.

Some of the more traditional Waswanipi Cree Indians of the Canadian sub-arctic display a different explanation of the world than the Western tendency towards understanding linear cause and effects in hazards and disasters. Instead of explaining hazards and risk perceptions through the a mechanical of cause and effect, traditional Waswanipi Cree tend to perceive a “web of relationships between the myriad beings and forces at play” in the natural world in which the inhabitants are imbued with the same qualities as human beings- the natural world has character and temperament. So when a natural hazard, such as an unusually strong blizzard event occurs, traditional Cree peoples may be less inclined to ask ‘‘what caused this anomaly?’ and ‘how do weather systems work?’ They are more prone to ask ‘who did this and why?’” (Suzuki & Knudtson, 1993, p. 69).

This places perceptions of risk for hazards at a meta-level of understanding in which indigenous peoples seek explanations beyond using only the empirical methods of Western science. However, at times, a Western worldview of cause and effect explanations for hazards can conflict with cultural explanations, epistemologies and cosmologies. For instance, the dominant Western perspective of cause and effect thinking can be seen in epistemological explanations for earthquakes and subsequent tsunamis. In a Western scientific epistemology view these phenomena are known to be caused by displacement of fault plates in the earth’s crust (Silva, Fran, Vilar, & Alcaniz, 2006). However, ethnographic research regarding the earthquake and tsunami in 2004 near Sumatra and Java, mentioned in the introduction above, revealed additional epistemological explanations. While both Western trained scientists and Indigenous Javanese peoples understand earthquakes and explain tsunamis to be physically caused by the
movement of tectonic plates, indigenous explanations of the underlying cause (or the source of
the primary mover) of the disaster was rooted in interpretations and meaning-making that
bridged tradition and modernity; for some Javanese, their epistemological explanations for
disaster events are caused by how risk and hazards co-exist. According to some of the
Indigenous Javanese, the spirits who sent the tsunami disaster did so intentionally, to remind the
Javanese people to return to their traditional life-ways. In this context, the interpretation of risk
and danger was negotiated between the high risk of participating in the negative aspects of
modernity, such as secularization, materialism, moral decay and ecological destruction, and the
lower risk perception that accompanies living with their traditional values of spirituality,
harmony and living in balance with the cosmos (Schlehe, 2010). Hence, in the minds of some
Indigenous Javanese the real cause of the disaster was perceived to be a lack of balance between
the people and the dictates of their cultural and cosmological system that instructed them on the
correct ways to live their lives.

The way of explaining the world for many American Indians is noted in the relational
model of being. The relational model reflects the value of maintaining cosmological balance in
order to avoid heightened risks, not only environmental hazards, but also towards maintaining
balance in one’s health status. In a relational model of an American Indian worldview, the
cultural symbol of the Medicine Wheel is often used to represent the cosmos and the values of
what ought to be pursued. The Medicine Wheel usually consists of a circle with a cross in the
middle, separating the symbol into four equal quadrants, with balance at the center of the
concept. Balance binds together the, mental, physical and emotional components in the spiritual
context of the individual and the community or the tribe and focuses on wholeness and balance
(Cross et al., 2011, p. 94).
In the relational worldview, when these domains are out of balance the system is interpreted as experiencing illness, disparity and imbalance. At the levels of the individual and the group, lack of balance between the four quadrants of the Medicine Wheel is seen to raise the risk for destruction. Balance also implies the mechanism of reciprocity, which embodies the mutual relationship between man, nature and the cosmos. The idea of reciprocity is a “ubiquitous norm” in American Indian communities (Salois, Holkup, Tripp-Reimer, & Weinert, 2006) and is often referred to in terms of building relationship with the land because of the nourishment and sustenance it provides. Though not all American Indians would agree with this sentiment, there is a certain sense of obligation to keep the balance of nature stable by maintaining a sense of reciprocity with the natural world. Some authors relate the concept of reciprocity to spirituality, saying, “If you take something, you have to give something back. This keeps life in balance. In this way, all knowledge is spiritual” (Deiter & Otway, 2002 p. 3). This reliance on reciprocity includes obligations that a person and group has to the natural environment in their worldview, which is front and center in daily life and is enmeshed in maintaining the balance between man-nature-cosmos (Schweninger, 1993). These ideas of balance and reciprocity are spread throughout indigenous worldviews in terms of their epistemological relationship to the land, which is nearly an omnipresent theme for indigenous peoples everywhere.

Though the symbolic content of each quadrant in the Medicine Wheel varies within and between tribes, the iconography carries the meaning and explanations for life experiences across time and space. For many American Indians these cultural meanings and explanations are based on the ideal integration of the individual, the family and the tribe, with each of these seen as part of and representative of the universe. This integration requires maintenance of balance between
cosmic forces (Hill, 2006). When some American Indians feel there is inequity in these cosmic forces, they tend to explain and interpret hazards and disasters in light of this imbalance. Due to the obvious rise in frequency and intensity of disasters in recent years, it is likely some research participants will acknowledge the increase and will invoke a more indigenous worldview to explain it. However, because of the omnipresent 24 hour news cycle coverage of dangerous environmental hazards in our modern risk society (Beck, 1992) make it seem like the lack of balance between humanity and the natural world is only getting worse, explaining the world in terms of balance and imbalance with such dire consequences for the future could of the planet leave one feeling ambivalent about planning for disasters.

Way of Relating to the World: Individualistic and Collectivist

An important distinction between a Western and indigenous worldview is the extent to which individual, groups and institutions relate to the world more in terms of an individualistic frame of reference (more valued in a Western way of relating to the world) or a collectivistic mode (more common in an indigenous way of relating to the world). As discussed, a Western worldview tends to place a high cultural value of the individual over that of the collective, the group or the community. However, this atomistic individual is idealized, entrenched in an objective rationality and measures success based on competitive individualistic achievements. This way of relating between the individual and the group is not always valued in many American Indian communities. Yet the individual does not lack value as they develop through different stages of life. Each individual is seen as continually “becoming” throughout the processes of life, always in the process of developing gifts and talents that contribute to continuance of the ontological balance of the humanity, the natural world and the universe, and
thus maintaining stability of the tribe. This is achieved through living out the cosmological stories handed down generationally that reify the interconnectedness in which all humans, animals, plants and objects in the natural world have in creating a harmonious whole of the universe. This significance of interdependence and relationship between natural phenomena is evident in the words of Vine Deloria Jr., an Oglala Sioux author, theologian, historian and activist, who said “Everything in the natural world has relationships with every other thing and the total set of relationships makes up the natural world as we experience it” (Deloria, 1992, p. 34).

The epistemological foundation of collective needs and desires taking precedence over those of the individual is important for bridging and bonding the micro individual with the macro-level community and tribal members and institutions (Lowe, 2002). While every individual is certainly valued in an American Indian worldview, it is the help and support of individuals provided to families and communities, and an individual’s contributions to the cultural continuity of the family, tribe and community that is more the focus. The individual and the group are interdependent, one cannot exist without the other. Wilma Mankiller, former principal chief of the Cherokee Nation expressed well this relationship between individual and community: “In many Native communities, there is a much greater emphasis on the collective achievements of the family or the community than on those of the individual. Native people who have achieved great personal success, though respected, are not held in the same esteem as those who have achieved great success in helping others. The latter are held in the highest esteem” (Crow, 1993, p. 200). Many individuals do not see themselves as separate from the group. Instead, American Indian individuals tend to be viewed as an “extension” of the family, community and tribe, as well as an ontological extension of the universe. To illustrate this
relationship, interdependence and interconnection is reflected in the relationship between mother and fetus during pregnancy in which the “mother and fetus are viewed as interrelated and as affecting each other: They are one but they are also two” (Lowe, 2002, p. 6).

Differing family and household structure preferences also relate insights into the distinction between Western and indigenous ways of relating to the individual in terms of the group or the collective. In a Western mode, the nuclear family unit has been valued as the primary organizational pattern of the institution of the household for a long time (Robertshaw & Curtin, 1977). Independence and eventual separation of the individual from the nuclear family unit is foundational to the success of the individual, the family and society. However, many American Indians value extended families over the nuclear family. The importance of extended family in American Indian communities, especially on reservations, is evident in the high number of Indian families that contain at least three generations concurrently residing in one household unit (Lonczak et al., 2007). Where kinship responsibilities often lessen with age and development in a Western worldview, in many indigenous communities, responsibilities towards the tribe tend to increase with age for some. Younger individuals are often expected to stay within the community and help support extended family and tribal institutions, and elders are expected to assume greater kinship responsibilities as they age and develop. Elders are important for bridging the individual and the community. For example, even when biological parents are not living in the household, in American Indian families there is often an organizational principle reflecting cultural connectedness, in that grandparents often fulfill roles left open by absent parents. In fact, it is not uncommon that American Indian elders petition their children for the privilege of primary care responsibilities for some grandchildren. But this is not a new phenomenon. As in many ethnic minority groups, elders in Indian country are
sometimes a foci of cultural continuity in the family and community, acting as cultural conservators responsible for enculturation for Indian youth both historically, contemporarily and across American Indian groups (Weibel-Orlando, 1990).

The interdependence between the individual and the group is embedded the social fabric of the collective life of many American Indian communities. However, oftentimes these rules of relationship and correct social behavior are more axiomatically implied, rather than clearly spelled out. Many of the rules of correct social behavior are represented in the cosmological stories told and retold within American Indian cultures. These rules of behavior and social action are not always apparent but are “implicated in the production and reproduction of social practices are only tacitly grasped by actors” (Giddens, 1984, p. 22). Though the rules of correct behavior may go unspoken and often uncodified, they spin a web of interdependencies that create social order. These rules are tied to “expectations, obligations, actions and interactions … bonds and mutualities [that] ensure a degree of regularity or orderliness to social action (Jaeger, 2001, p. 15). Not only does this weave the individual into the social fabric of community life, it is also important to one’s sense of being. The creation and recreation of correct relationships during repeated social encounters reproduces epistemic foundations for social life and is critical to “the sustaining of ontological security” (Giddens, 1984, p. 23).

The value of the group is also noted in the social networking of many American Indians who express value of hazard risk information from trustworthy face-to-face interactions and community networking. These are normative features of many American Indian communities (Thompson, 2011). Whether regarding activities of daily living or emergency situations of a hazard event, consulting and depending on family and friends in ones’ social network in American Indian communities is primary (Mars, 2010).
There are also many networking links among and between some American Indian families who reside in reservation communities, as well as families and communities within urban areas, many of whom often maintain close ties to their reservations of origin. As the data collected here shows, many families on a given reservation are of biological relation to one another, and many urban Native peoples have also banded together and formed American Indian communities in metropolitan areas. Within these constructed and emergent families, as well as through community and social support networks, there is often a great deal of interconnection and support through the continual social interactions that have emerged over the generations. Many of these families and social networks have long shared the contentious politics of American Indian life on the northern plains, as well as the experience of historical trauma (Brave Heart, 2003) since contact with Europeans through overlapping periods of attempted genocide, removal from traditional homelands, colonization, land loss, isolation onto reservations and being forced into urban areas during attempted termination of treaty rights with American Indians in the 1950’s (Snipp, 1996).

Although disasters are often portrayed in news media as equally threatening to everyone due to the seemingly random quality of these phenomena, disasters are not of equal consequence to all groups of people. The conventional view of disasters affecting all people equally reflects larger ideas and symbols of the vagaries of the American ideals of rugged and competitive individualism that veil vulnerabilities of groups of people, some more so than others. These symbolic ideals use deep structures that rely on the fiction of American meritocracy and the myth of the free market economy in which every individual has the same opportunities to achieve the American Dream and all experience the same obstacles to that dream (Peacock & Girard, 1997). However, at different times and in various places ecological networks can
produce pockets of vulnerability in which poor and minority groups are disproportionately impacted by disasters. This is evident in how during the best of times, when a disaster is not present, the housing market in the U.S. has “systematically failed” to produce adequate housing for low-income minorities (Peacock and Girard, 1997, p. 172). Risk is concentrated in certain groups of people such as ethnic minorities due to patterns of social organization that result in stratification of groups that determine unequal access to resources. However, perceived risk also includes both a person’s assessment of a natural hazard, as well as individual and community vulnerability (Patterson, Weil, & Patel, 2010). It is known that some of the most vulnerable people in natural disasters include ethnic minorities and those who lack social networks and strong social bonds or relationships (Thomalla et al., 2006). Relating to the world through close ties to the group often includes more intimate relations between social networks that provide a form of social resilience which assists in disaster planning and after a hazard event. Social resilience of individuals and groups is tied to theories of “social capital” that stress the importance of social networks, reciprocity, and interpersonal trust, which “allow individuals and groups to accomplish greater things than they could by their isolated efforts” (Patterson et al., 2010, p. 127). Resilience can aid in disaster planning by providing adaptive processes that “facilitate the ability of the social system to re-organize, change, and learn in response to a threat” (Cutter et al., 2008, p. 599). Social networks are constituted in institutional and kinship relations through which individuals, families, households and communities can provide an important source of resilience in terms of risk perceptions and response to a disaster event, depending on the extent to which a social network is “enmeshed in local kinship networks of reciprocity” (Morrow, 1999, p. 7). Social networks provide various forms of material support and provide cultural continuity for American Indian communities. During disasters both social
networks of extended family and friends, and increased access to resources such as information, knowledge and technology have been shown to influence vulnerability in terms of environmental hazards (Cutter, Boruff, & Shirley, 2003). Moreover, the most effective provision of social support comes from people who are socially similar to one another and who experience similar stressors because similar social networks can provide baseline support which can aid in mediating stress and coping during crises (Thoits, 1995; Unger & Powell, 1980). Social networks can be important aspects of both vulnerability and resilience in terms of disaster risk. For example, the interconnection between social networks helps some communities to weather a disaster (Wallace & Wallace, 2008). Social networks provide a sense of protection. They share resources and build a sense of community, which can reduce risk perceptions for hazards by providing knowledge and security that the community will aid in limiting negative consequences of a disaster and maximize the possibility for recovery after a disaster occurs (Paton, Millar, & Johnston, 2001; Paton, 2003).

Disaster planning and evacuation decision making can also be influenced by social networks that exist above the level of the individual. Social networks within tight-knit communities of American Indians are relevant to risk perception research in terms of how the mesh of relationships which envelops individuals can either inhibit or facilitate action such as planning and evacuation during a disaster. Evacuation decisions can involve chain reactions. For example, when an integral member of a social network decides not to plan for or evacuate during a disaster event, often other people not plan and/or will stay behind as well, or if one person decides to evacuate the opposite can happen. If one person makes the decision to evacuate, then, sometimes everybody in the social network follows (Eisenman, Cordasco, Asch, Golden, & Glik, 2007, p. s112). Although it is understandable that having connections to lots of
social networks may increase one’s sense of security and lower one’s sense of danger in the world in the face of hazards. However, it also feasible that being involved in many social networks could permit people to falsely think they have more material and non-material support from the family and community than they actually may have, thereby possibly providing a false sense of preparedness.

Way of Being in the World: Compartmentalization and Holism

An ontological way of being in the world in terms of existing by use of compartmentalization of experience or interpreting the world through a holistic perspective, also distinguishes between Western and an American Indian worldviews. In a Western way of being (or ontology) in the world, there is a tendency to compartmentalize the world in ways that detach the body, mind, spirit and nature from each other through systems of naming and categorizing. However, for many American Indians this is a foreign mode of being in the world. Indigenous peoples tend to experience being in the world “as a totality of personality and not as separate systems within the person” (Duran & Duran, 1995, p. 15). Compartmentalization permits only a limited view of social phenomena, while a holistic worldview tends to encompass as much of lived experience and reality into researching social phenomena as possible (DuFour, 2004).

The distinction between Western compartmentalization and more holistic indigenous ways of being can be seen in the ways each interprets the world through a binary dualist ontology, but in different ways. A Western worldview tends to have a bounded way of placing phenomena into discreet binary dualistic categories, whereas an indigenous ontology tends to rely more upon a way of being in which binary phenomena exist along a continuum. Although both perspectives involve binary dualisms, Western ontology tends to construct concepts in ways
that involve exclusionary and contrasting themes in which hierarchical value judgments prevail. These may include valuing good over evil, mind over body, male over female, or development of wilderness over nature conservancy (Waters, 2004). Although these categories are present in American Indian ontology, many Natives do not place these binary dualisms into mutually exclusive categories. Instead, these dualisms are seen as more “complementary” to ways of being. This ontology “puts together such constructs without maintaining sharp and clear boundary distinctions” in ways of being that bring constructs closer together, rather than compartmentalizing them off from each other (Waters, 2004, p. 98). In this way, indigenous ontology presents a flexible and paradoxical way of being in the world. Ontological expressions of constructs such as male verses female are brought together in a manner that, like in the mother and fetus example above, “one would remain itself, and also be part of the other” (Lowe, 2002, p. 6). An American Indian ontological way of being tends to exclude the hierarchical positionality of valuing one construct as superior to the other (Waters, 2004, pp. 98-99).

A less compartmentalized ontology lends itself nicely to a holistic perspective which tends to lack distinctive and clear border lines that separate and bracket off the lived experiences of individual and social phenomena. The dimensions of holism include the components of balance, relationship and culture (Lowe & Struthers, 2001). For Natives, their way of being often involves the continuous linkage between all things and is based on a “universal connectedness between individuals and others as holistic beings” (Hill, 2006, p. 212). In the worldviews of many American Indians, man and nature are in constant connection, which often includes a high value on spirituality. For indigenous peoples, the relationship between humans and the natural world is often honored and reified in a routine of daily practices, processes and ceremonies that are continuous and on-going throughout the year, unlike a Western Protestant or
Catholic ontology that maintains a spiritual connection to the cosmos on an intermittent basis or in a weekly ceremony, ritual time/space rooted in hierarchical religious institutions, often reported as disconnected from daily life. However, for many American Indians, spirituality brings together all aspects of an indigenous worldview. It is the “matrix of the creation/universe that ties all the dimensions of an indigenous worldview together, encompassing all aspects of creation, such as “people, animals, plants, earth, sky, moon, and stars, and the elements which includes wind, water, fire, thunder, clouds, lightening and rain” (Hill, 2006, p. 212).

To illustrate the distinction between a more discreet Western ontology and an indigenous holistic perspective, a compartmentalized perspective is clear in the metaphor of a troupe of blind men who, after touching different parts of an elephant, attempt to pontificate on the underlying truth of elephantness. Based on each man’s circumscribed experience, none of the men can produce a holistic picture of elephantness. Each compartmentalizes and reduces elephantness down to essentialized qualities that lead each astray. The man who touches the trunk of the elephant describes elephantness as a long and thick snake, the one who touches the foot describes elephantness as being like a tree trunk; the man who touches the side of the elephant describes elephantness as like unto a wall, and so on. The blind men observe nature in terms of an object, an inanimate “other,” instead of the living, fluid and dynamic ways nature is viewed from an indigenous worldview. In *The Savage Mind* (Lévi-Strauss, 1966) Levi-Strauss says the Native worldview does the opposite of the blind men. It totalizes, thus combining all possible aspects of elephantness into one holistic view that is “multisensory and boundless in scope” (Suzuki & Knudtson, 1993, p. 13).

The importance of having a holistic perspective when exploring perceived risk associated with environmental hazards is that holism allows a wider, deeper and more detailed view of all
the various factors that could influence risk perceptions. Whether exploring American Indian vulnerabilities to hazards, their communication methods and styles regarding risks, their ancestral and contemporary American Indian disaster planning perspectives, or how they trust or distrust institutions involved with hazards and disasters, a holistic perspective permits researchers to consider a much wider range of contingencies. If risk perception and disaster planning can be momentarily thought of as the phenomenon of elephantness in the metaphor above, focusing on the whole animal may permit a better understanding of how American Indians interpret environmental hazards in terms of risk and danger. Moreover, researchers taking a holistic approach to the study of risk perceptions and disaster planning with American Indian groups will better prepare them to enter the field with a sense of cultural humility through which relationships can be built and nurtured within these communities. This is critical to carrying out research that matters to American Indian communities because without a sense of trust among researchers and research participants it is unlikely that useful explorations can be done at all.

At organizational and policy making levels, understanding and pursuing a holistic approach to risk perception and disaster planning is important as well. The old ideas of a top-down, command-and-control approach to disasters which incorporate a one-size-fits-all way of planning are outmoded and dangerous, and have proven less than adequate in past disasters. For example, the linear, hierarchical ‘command and control’ system lacked contingency strategies in the National Response Plan (NRP) during Hurricane Katrina in 2005 and in 1992 the National Response Framework (NRF) failed in operations and coordination of resources during hurricane Andrew. Clearly, with the cultural complexity in over 560 federally recognized American Indian tribes, and the lack of research regarding hazards across Indian country, organizations and policy
makers who plan to work with these communities will require a holistic approach to understand risk perceptions from the voices of the people residing in those communities. Although the ideas of interdependency and holism have long been a basic aspect of organizational design in complex environments institutions that deal with disasters, future organizational planning in Indian country will require the exploratory baseline data captured by projects such as this one. While hazards research has not been quick to include these voices and engage in larger debates about local risk perceptions (Few, 2003), this research attempts to understand how American Indian ontological ways of being may broaden our knowledge about indigenous risk perceptions and contribute to the call for increased community participation in disaster management. It seems that existing in the world with more of a holistic way of being would provide a sense of security regarding uncertainty in the world; holism provides almost a religious overview of culture systems in which constructions regarding social life emerge. These may include symbolic representations of “the general order of existence” noted in Geertz’s models of reality, and models for reality (Schilbrack, 2005), which could serve to buttress one’s sense of danger in a risky world. It may be that a holistic perspective provides a sense of connection between the human and natural worlds and that relates to risk perceptions and one’s sense of urgency towards disaster planning.

As discussed later, this research project incorporates qualitative interview data from rural and urban American Indians who mostly reside on the northern Great Plains in the United States. Although attempts to understand hazard and risk perceptions in people who reside in this region began with the 1960s work of Gilbert White’s group at Chicago, they focused on perceptions of droughts impacting mostly White wheat farmers in the region (Saarinen, 1966). However, little, if any risk perception research regarding hazards has been completed on Native peoples in the
same area. Even in White’s efforts, most of his work did not utilize qualitative methods, but “degenerated into standardized questionnaire surveys and ‘official’ analyses applied to developing countries” (Hakim, 2012, p. 8). Although the above discussion regarding American Indian worldviews may help researchers better understand how indigenous peoples begin to approach interpretation of risk and danger in the environment, and to help guide research projects that seek to ferret out the underlying cultural dimensions of how differently many American Indians see their relationship to the environment, a proper discussion of the concept of risk perception is required to understand the relationships between an indigenous worldviews, risk perceptions and disaster planning in a sample of American Indians.

From the above literature regarding worldviews, it is evident that the concept is not as clear cut as the terms seems to imply. While it is established that one’s worldview can influence hazard risk perception and subsequent disaster planning (Douglas & Wildavsky, 1982; Flint & Luloff, 2005; Leiserowitz, 2006), the concept of risk perception is similarly multifaceted as worldviews. Risk perception study is important. As Fischhoff stated, understanding perceptions is important to risk management and risk communication because it is unpredictable how people will respond to a concern without knowing their perceptions of the phenomenon (Fischhoff, 1985). Thus, a review of risk perception research is presented next.

Risk Perceptions

The modern world appears to be rife with increasing volatility and risks (Beck, 1992; Coleman, 2006). A glimpse of the daily news presents a smorgasbord of hurricanes, earthquakes, heat waves, droughts, floods, tornados, wildfires, landslides, wars, terrorism, disease, famine, and a host of other catastrophes which seem to be plentiful. But the rise in
natural and man-made disasters is not new. Over the past half-century the perceptions, impacts, frequency and intensity of disasters has risen dramatically (Costanza & Farley, 2007; Kulatunga, 2010; Skoufias, 2003). The increased damage to property, infrastructure and loss of life highlights the need for understanding risk perceptions of catastrophic hazards in order for individuals, households, communities and policy makers to better prepare for disasters.

Although disaster experiences are fresh and salient during the event and shortly thereafter, our perceptions of risk and the urgent need for better planning seem to lose importance over time. It seems soon after a disaster, it is not long until the immediacy and concern fades into a hyperbolic tendency to discount distal events relative to immediate concerns; we myopically forget just how bad a disaster can be in lieu of taking care of activities of daily living (Kunreuther, 2008).

Paradoxically, the rising perception of risks and hazards existing in our modern “risk society” (Beck, 1992) presents an ironic challenge to Enlightenment ideas of expected continual technological and social “progress.” In the pursuit of constant improvement and efficiency; some feel that the unintended bads of modernization often outweigh the goods of progress. (Jaeger, 2001, p. 14-15). But there is disparity in the allocation of the bads of environmental risks. Just as natural and man-made disasters do not impact all segments of the population evenly, it has been documented that minority populations are disproportionately impacted by environmental hazards (Shriver & Webb, 2009).

Indeed, since the 1970s, the rise in environmental concerns, changes in environmental policy and opposition to siting of noxious waste facilities or storage of spent nuclear wastes in or near population centers have created a backlash for poor minority communities such as those of American Indians. These shifts have led hazardous waste siting facilities to follow the path of least (political) resistance and has resulted in unequal placement of hazardous dumps and waste
sites in low-income and minority communities, who paradoxically benefit the least from these industrial efforts (Saha & Mohai, 2005). Moreover, it has been documented that some noxious industries overtly exploit weaknesses in some rural minority communities’ abilities to fight back against such dangerous intrusions. While exposing them to environmental risks, many of these same invasive industries utilize the regions “unskilled, unorganized, and non-mobile workforce to maintain competitive profit margins” (Stretesky, Johnston, & Arney, 2003). Yet, while it is clear that many of these bads of modernization disproportionately impact American Indian communities by the placement of industries in or near indigenous communities that expose these communities to environmental hazards, there is still a gap in the literature regarding how American Indians perceive and interpret danger and risk associated with these man-made hazards, as well as how they perceive natural hazards. More research is required in order to “examine how local resident populations perceive these environmental threats” (Shriver & Webb, 2009, p. 270). Thus, due to the dearth of research on American Indian risk perceptions regarding hazards and disasters, this research project seeks to begin to fill this gap.

The contemporary literature on risk reflects a wide range of factors that influence risk perception. Since the publication of Rachel Carson’s *Silent Spring* (2002), which helped shift the public gaze towards environmental hazards like the use of DDT in the early sixties, risk has become part of the common discourse of social and scientific experts concerning environmental hazards (Adeola, 2007). In culturally non-specific contexts, risk has been studied extensively and dozens of factors have been explored in terms of risk perception. Research supports that risk perceptions are informed by physical and socio-economic and political factors, as well as by cultural biases, and network relationships (Fothergill, 1996). For example, at a macro-level risk perceptions are influenced by the environmental physical settings of an area (Cross, 2001), by
“complex social, political, and cultural processes” (Bickerstaff, 2004), by patterns of racial inequality in terms of land use and building construction patterns (Fothergill et al., 1999), by differences between expert and lay opinions about hazards (Slovic, 1987; Slovic & Weber, 2002) and by the situational contexts in which hazard events take place (Frazier, Harvey, & Montz, 1986; Khan, 2008; Tobin et al., 2011). On a more micro-level, risk perceptions are known to be influenced by an individual’s race/ethnicity (Drabek, 1986; Satterfield, Mertz, & Slovic, 2004), personality, age, gender, knowledge level (Fothergill, 1996), and one’s socio-economic status (Manning, 2005; Khan et al., 2012; Tobin et al., 2011). Risk perceptions are also influenced by whether a person perceives a given risk exposure to a hazard as being voluntary or not (Manning, 2005; Douglas & Wildavsky, 1982), whether one feels a sense of control in the world (Gaillard & Texier, 2010; Khan et al., 2012; McClure, Walkey, & Allen, 1999), one’s sense of dread and fear of the unknown (Slimak & Dietz, 2006), by individual proximity to particular environmental hazards (Fowler, Hamby, Rusco, Rusco, & Consultants, 1991), one’s prior experience with hazards and disasters (Gaillard et al., 2008), individual cognitive abilities (Tobin et al., 2011; Jaeger, 2001), one’s sense of place attachment and efforts towards identity and culture protection (Manning 2005; Weber & Morris, 2010), as well as by one’s sense of trust (Siegrist, Gutscher, & Earle, 2005), to name just a few factors. Due to the lack of clarity in the definition of risk, and from the variety of factors that influence how we perceive the phenomenon, it is clear that risk perception is a multidimensional construct that lacks analytical cohesion. Within these fields pursuing risk perception “the field is marked by considerable theoretical and methodological differences” (Bickerstaff, 2004, p. 827). Thus, it seems risk perception is indeed a “phenomenon in search of an explanation” (Sjöberg, 2000, p. 1). Research that has sought to explain risk perceptions lies along a risk research continuum, with a realist or technical approach at one end
of the continuum, and social constructionist or relativist explanations at the other end. The realist/technical perspective casts risk as objective and relies more on quantitative measures that result in statistical probabilities regarding whether a hazard situation is likely to occur or not. Uncertainties that are not amenable to “calculable probability” tend to be excluded from the purview of technical risk analysis (Flint & Luloff, 2005). At the social constructionist/relativist end of the continuum, risk is seen as more subjective. Instead of technical, quantitative measures of risk perceptions, the constructionist perspective emphasizes how people subjectively interpret the world around them through the filters of how they think and their cultural worldviews, in order to assign meanings to phenomena in their environment (Douglas & Wildavsky, 1982; Flint & Luloff, 2005). One of the most cited paradigms that has attempted to explain risk perception is the psychometric perspective, which takes a cognitive and individual approach to measure perceived risk associated with hazards (Lazo, Kinnell, & Fisher, 2000).

Psychometrics

The impetus of the psychometric paradigm of risk perception emerged out of efforts to weigh technological risks against the benefits that new and dangerous technologies provide in order to answer the question, “how safe is safe enough?” (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978, p. 127). However, the actual psychometric model of risk perception emerged from the fields of psychology and decision theory and represents a more positivist framing of risk. Psychometrics assumes risk is defined subjectively by individuals enmeshed in social, cultural, institutional and psychological phenomena. Psychometrics utilizes objective measure to assess these subjective phenomena (Rippl, 2002; Fischhoff et al., 1978; Slovic, Fischhoff, & Lichtenstein, 1979). This approach to risk focuses on the characteristics of particular hazards to
explain risk perceptions (Slovic, 1987) and is based on the assumption that non-expert (lay person) perceptions of risk and danger are inadequate as interpretations of risk (Flint & Luloff, 2005). Developed in the 1970’s by Fischhoff et al (1978) to elicit quantitative estimations of perceived risks and benefits associated with a wide range of natural and technological hazards, as well as levels of acceptable risk, the psychometric paradigm relies on cognitive psychology and frames risk in terms of individual subjective fears or expectations regarding uncertainty or unwanted outcomes of events or actions. Another assumption of the Psychometric paradigm is that by highlighting cognitive factors that influence awareness of risk, risk perceptions can be quantified and thus, used to predict human perceptions and subsequent behavior in the face of environmental risks (Adeola, 2007).

Ironically, while the originators of the psychometric model of risk focused on the subjective preferences of individuals, in line with a social constructionist/relativist position, the model attempts to be objective in its methods and inferences derived from those methods, thus leaning towards the realist/technical part of the objective-subjective continuum. Yet, evidence indicates that risk perception is less influenced by statistics associated with hazards and disasters, such as the numbers of fatalities or economic costs associated with disasters, and more so by local understandings and meaning associated with hazards. Interpretation of events and environmental phenomena are more conditioned by values associated with ontological, cosmological and epistemological aspects of worldviews discussed above, which vary “according to local bodies of assumptions, conventions and practices” (Boholm, 1998, pp. 135-136).

Nonetheless, Paul Slovic, a key contributor to the Psychometric modeling of risk, says that the paradigm moves beyond quantitative measure of potential or real body counts and
monetary costs, and allows researchers to capture data regarding a wide range of activities and technologies using quantitative measures of perceived risks to “disentangle” the many influences on risk perceptions (Jaeger, 2001, p. 102). So while the model uses subjective, individual data, it also attempts to be more objectivist in approach in order to classify, understand and predict the types of risk that people perceive by using statistical measures such as factor analyses and intercorrelations to discover patterns among variables that influence risk perception (Fischhoff et al., 1978; Slovic, 1987), a difficult task without exploratory power that qualitative methods provide, to be sure.

Early empirical work by Slovic et al. (1979) revealed important cognitive factors that influence risk perception, such as the dread risk factor and the unknown factor (Ripple, 2002). Later psychometric approaches to risk explored other subjective aspects of risk, while building on the long held understanding that risk is highly influenced by “a host of social, cultural, institutional and psychological factors… and shared worldviews” (Adeola, 2007, p. 15). Psychometric work retained its objectivist approach to risk using probability calculus and formal logic, but broadened to account for the affective role of human experiential systems.

Experiential systems of risk perceptions rely on images and associations that convey “risk as feeling” or “affect,” which motivates behavior and social action (Slovic, Finucane, Peters, & MacGregor, 2004). While the analytic system is slow and conscious, the experiential system for comprehending risk is holistic, intuitive, automatic, and fast, when compared to analytic systems. While the analytic system sticks closely to the foundations of the psychometric paradigm, Slovic’s “experiential system” also looks more towards the cultural turn noted in other disciplines beginning in the 1970s and 80s. Experiential models recognize more holistic ways of knowing risks perceptions and hazards. They contribute to a necessary subjective understanding
of risk perceptions, especially in research across and within race/ethnicity groups. Though still basically a “psychometric” paradigm, Slovic’s later approach to risk perception leans more towards sociological, anthropological and cultural explanations of risk perceptions that emerged just after Slovic, Fischhoff and others pioneered the paradigm in the 1980s. Nonetheless, the analytic system for comprehending risk is a more quantitative approach than the experiential system. The analytical assessment of risk uses algorithms and rules laden with values and normative aspects of social life and involves a type of constructed rationality based on formal logic and probability calculus. In this approach, the rationale for a given behavior is assumed to be consciously known, while the objective realities of risk are also encoded in abstract symbols words, and numbers (Slovic et al., 1979).

In the analytic system, (Slovic et al., 2004), some authors began to focus more directly on how emotions and fear play roles in risk as feelings. While feelings were present in earlier psychometric research on risk perception (Fischhoff et al., 1978) they looked at dread as a predictor of public perceptions of and tolerance for many hazard risks. Dread, as a feeling, also involved factors that bear on emotional states, such as having a sense of freedom of will or action (voluntarism) in whatever is risky, having a sense of controllability of risks and hazards, as well as perceived lethality and “fairness” of exposure to hazards (Slovic et al., 2004, pp. 4-5). In Slovic’s experiential system, feelings play pivotal roles in comprehension of risk and how people respond to risk and hazards. Focus on affect broadens the concept of risk perception in that it moves risk perception research towards culturally-leaning literatures that build on dual-process theories of “thinking, knowing and information processing” (Slovic et al., 2004, p. 3). Where the analytic system alone is more deliberative, verbal and rational, and relies on logical deductive reasoning to comprehend risk and hazards, the experiential system is more holistic. It is more a
habitual, non-verbal, narrative approach embedded in lived experience. The experiential system depends more on a pleasure-pain orientation and “associationistic connections,” (Slovic et al., 2004, p. 313) in which behavior is mediated. Instead of justification of risk perceptions by use of scientific precision, logic and evidence, an experiential approach to risk is dependent upon self-evident validity, a validity which equates experiencing risk and hazards, with “believing” one’s perceptions, which, as stated above are likely influenced by one’s particular worldview. More important for decision making, using an affective system in research for understanding risk perceptions reveals other benefits. Affective systems are relatively simple to access and feelings are more efficient and faster when dealing with dangerous hazards and associated uncertainty (Slovic et al., 2004).

Even with Slovic’s foray into affect, some reject a psychometric approach altogether, and for good reason. While Slovic’s early work and later inclusion of affect hoped to discern similarity and differences in risk perceptions among different groups of people, follow-up work at best showed inconsistent results (Adeola, 2007, p. 15). Some criticized the psychometric approach as unable to account for differentiation of risk perception across social and ethnic groups, supporting that the model ignored social and cultural risk factors (Adeola, 2007, p. 15; Rippl, 2002). These gaps in the knowledge of cross-cultural perceptions of risk are important because they tend to hinder risk mitigation. The significance of not knowing risk perceptions across race/ethnicity groups is clear in natural disaster statistics of the past. For example, knowing little about how African Americans perceive risk, and thus being unable to predict behavior correlates, has led to catastrophic outcomes for some minority groups. During Hurricane Audrey in 1957 the mortality rate for African Americans was ten times the per capita rate of death for Whites (Perry & Green, 1982, p. 307). Hence, lack of knowledge about cross-
cultural similarity and difference in risk perceptions limits behavior prediction and subsequent efforts at preparedness activities. Lack of knowledge also perpetuates differential morbidity and mortality rates in terms of race/ethnicity groups, as minorities have long experienced worse outcomes than majority group members in natural hazards.

Other criticisms of the psychometric approach to risk include research methods problems. Some say its explanatory power relies too much on aggregate, mean values, explaining little regarding variance in risk perception (Sjöberg, 2000). Furthermore, the approach has failed to explain social and cultural influences on risk perception as well as cross-cultural variation in levels of risk perception (Rippl, 2002; Adeola, 2007). This may be due to using homogenous race/ethnicity groups, suggesting that results from these studies may not reflect the true variability and diversity of populations that share values, beliefs, life experiences and worldviews (Vaughan & Nordenstam, 1991). The psychometric paradigm of risk perception relates to the research question in this dissertation in two overlapping ways. First, while the qualitative methods used in this dissertation are far removed from the quantitative methods employed in the psychometric model, psychometrics does provide several factors or analytical categories that frame the exploration into risk perceptions of the interviewees in the study sample, such as dread and fear of the unknown and prior experience with disasters. Secondly, according to Paul Slovic, some of the sociological research regarding risk perceptions reveal that risk perception factors associated with psychometrics may actually have their roots in the cultural and social contexts in which they emerge. For example, sociological research supports that risk perceptions may actually form after a disaster experience, as a rationale for an individual’s behavior during a disaster. In some cases, responses to hazards are determined
through “social influences transmitted by friends, family, fellow workers and public officials” (Mayo & Hollander, 1991, p. 62).

Cultural Theory

To address the shortcomings of psychometrics, the cultural theory (CT) of risk emerged in the 1980’s to focus on the social and cultural factors of risk perception in the work of Douglas and Wildavsky (1982). CT views interpretation of environmental risk and danger as “socially and culturally framed” and shaped by social structure within which individuals are entrenched. This social context informs individual’s worldviews (Klinke & Renn, 2002; Rippl, 2002), and thus their perceptions of risk. In CT, risk perception varies because people participate in different socio-cultural groups in which individuals often have divergent worldviews (Boholm, 1998; Rippl, 2002). Rather than psychometric emphasis on cognitive processes that may reflect a sense of locus of control in risk perception, in CT the shared values and cultural biases of worldviews determine individual risk perceptions (Rippl, 2002). Exploring just how an American Indian worldview relates to perceptions of hazards, both technological and natural, and how these influence disaster planning, is the substance of this dissertation.

CT is best represented in Douglas and Wildavsky’s group/grid typology (1982), which deals with social cohesion and suggests that individuals determine what they fear in relation to one’s culture. In this model, cultural types are identified in terms of behavior patterns and ideas with a supporting cosmology that both justifies and reproduces ones’ cultural biases in perceptions of risk. The typology has four prototypical cultural types that vary along two dimensions; perceptions of social control (grid) and of social commitment (group). CT compares attachment or affinity towards group and/or grid along four quadrants in the typology; hierarchic
structures, fatalism, individualism and egalitarianism. The group dimension involves social boundaries and collective rights conferred on the individual, as well as protections and constraints of the group for the individual. In essence, the group-part of the typology relates to how an individual is bound to the collective and the extent to which the individual is absorbed in a group’s activities (Douglas, 1978). In the other dimension, grid refers to the “cross-hatch of rules to which individuals are subject in course of their interaction” (Douglas, 1978, p. 8). It is assumed that those who favor rigid social hierarchy more readily accept risk decisions stemming from experts or the government, whereas egalitarians tend to distrust them. Fatalists in this model lack close identification with a group but favor socially assigned classifications, and individualists fear limits on freedom and see opportunities in risk (Rippl, 2002).

As with psychometrics, the cultural types of CT are amenable to quantitative methods. Survey instruments include attitude measures regarding phenomena such as confidence in institutions, patriotism, authoritarianism, social order and law. While Douglas and Wildavsky (1982) provided a more subjective orientation towards risk perception, Dake’s (1991) quantitative methods has been used in many studies of risk and cultural theory (Ripple, 2002). Both the qualitative, subjective, socio-cultural focus of CT and Dake’s more objectivist empiricism of risk and cultural theory, have advanced the study of risk perceptions and worldview study. For example, CT provided an anthropological baseline for understanding how risk perception is socially and culturally framed in the interface of individuals and social structure, concluding that in such social framing worldviews can shape individuals’ perceptions of risk. Dake (1991) began to address the relationship between worldviews and risk by studying how contemporary worldviews and cultural biases are enmeshed in shared values and beliefs. Both CT and Dake’s work sought to explain and predict “what kind of people will perceive
which potential hazards, to be how dangerous” (Wildavsky & Dake, 1990, p. 42). Further, they also indicate the value of, and need for, more qualitative analyses of risk in terms of cultural types based on cosmologies or cultural biases, just the stuff of worldview research conducted here (Rippl, 2002; Dake, 1991). Thus, CT holds promise as a theory of action seeking to explain how people understand and act upon the world.

One contribution of CT for this dissertation is that it introduces culture as significant to worldviews and risk perceptions. However, there are two caveats concerning a cultural approach to risk perception. First, it is important to remember that Douglas’ grid/group typology was rooted in positivist and functionalist anthropology, which has its own limitations. Secondly, cultural studies have a tendency to cast culture as both cause of social problems, as well as cure in terms of social problems. Although cultural sensitivity has been a hot topic since the Indian self-determination efforts of the 1970’s, the idea of cultural competence highlights the problem of using culture in studies that look at things such as risk perceptions. Good intentions aside, inclusion of the term “culture” is itself problematic, and its use as both origin and answer for various problems is murky enough to call into question the utility of achieving any sort of “cultural competence.” The use of the “culture” concept has become part and parcel of the common image of ourselves as open minded and tolerant of diversity, and has found its way into state and federal legislation and programs, as well as into the workings of the private sector and academic domains. Other criticisms of the CT of risk include the paucity of evidence to explain peoples’ reactions to perceived risk, as well as other methodological concerns. For example, some question the validity of using Douglas and Wildavsky’s group-level data on individuals, yet both the psychometric approach and CT has acknowledged that quantitative scales pose measurement problems. CT also assumes risk constructs to be one-dimensional, and, while a
typical Crohnbach Alpha is commonly used to test reliability of the scales, validity is rarely measured (Rippl, 2002). CT’s low level of explanatory power is also limited by vague descriptions of phenomenon such as “tendencies, dispositions and worldviews” (Oltedal, Moen, Klempe, & Rundmo, 2004), thus the need of further qualitative study to gain thick descriptions of such phenomena.

However, since this dissertation explores the worldviews and risk perceptions of American Indians and utilizes individual data, culture figures significantly into the remainder of the dissertation. Cultural influences on interpretations of risk and danger will be elaborated upon in the results and discussion section below. Perceived risk regarding hazards and disasters depends partly on the thoughts and actions of individuals that are formed by deep structures embedded in one’s cultural milieu (Hoffman, 1999). For example, many of the indigenous communities who survived the Indian Ocean Tsunami of 2004 did so by relying on risk perceptions rooted in cultural knowledge (Kulatunga, 2010). Exact definitions “culture” are elusive and used loosely in nearly unlimited contexts (Lasky, 2002). Although there is a considerable debate in cultural sociology whether social structure or culture is more important in shaping the lived perceptions and experience of the individual and collective, or whether the binary even exists (Gans, 2012), culture, here, is defined as a "tool kit" that includes habits, skills, styles through which people construct "strategies of action" (Swidler, 1995, p. 273). Culture includes components such as values, norms, symbols that influence one’s way of life and provides strategies for survival that are reproduced and transferred by groups and individuals from generation to generation over time (Kulatunga, 2010). Though difficult to define and use, the importance of culture in disaster planning is evident in the broad ways culture influences worldviews and subsequent perceptions of risk related to natural hazards, yet culture is difficult
to pin down. Overall, culture has been neglected in risk reduction research (Palliyaguru, Amaratunga, & Haigh, 2010), which increases vulnerability to hazards (Kulatunga, 2010; Oliver-Smith & Hoffman, 1999). Cultural Theory responds to this neglect.

Another reason CT is important for this dissertation is because of the structural framework it provides in understanding how the interviewees perceive their sense of connection to the group and to concepts of power and control in their respective communities. For this dissertation, a cultural approach to understanding risk perception is framed in the same social and cultural context in which worldviews develop. Worldviews, perceptions of risk, and subsequent action (or non-action) are intertwined. People are socialized within and among socio-culturally informed worldviews that shape, and then are shaped by individuals’ risk perceptions. But these perceptions and individuals are also embedded in social structure in which shared cognitive patterns further mediate the development of a sense of danger, and serve as forms of bias in assessing risk information (Rippl, 2002; Douglas and Wildavsky, 1982).

From the above discussion of worldviews and risk perceptions, it is clear that both phenomena are as complex as the cultural contexts in which they are considered. Risk is tied to complex social structures and socialization processes that strongly influence early life experiences, and thus shapes values and worldviews (Stern, Dietz, & Guagnano, 1995). Similar to the sociological findings associated with psychometrics, and cultural theory, factors that raise or lower risk perception are often negotiated in terms of how much a given phenomena supports the social organization with which an individual is closely tied (Mayo & Hollander, 1991). Although quantitative methods that usually accompany CT are not used in this dissertation (except for discussing frequency of the most salient themes), CT serves as an important sensitizing framework through which many of the outcomes of the research can be understood.
For example, as orienting dispositions (Dake, 1991;) CT provides insights regarding how some of the individuals interviewed may view hazards and risk perceptions as they relate to individual ties that bind them to the collective, such as through the building and maintaining of social networks. This is especially evident in the close-knit rural reservation part of the sample where several research participants work as first responders or in other capacities in which they are embedded in the hierarchic structures of tribal culture, whereas others in the samples are completely disconnected from centralized authority structures. As such, the former group, those tied closely to hierarchic structures, are assumed to express worldviews that support institutional regulation and other structures that serve to support the socio-political power structures that provide cultural cohesion in their communities. On the other hand, the interviewees who are not part of the city or tribal structure may express more individualist, egalitarian or fatalistic worldviews, which may relate to their perceptions of risk accordingly, as well as their perspectives on disaster planning. Although this dissertation does not set out to test the psychometric model or the CT paradigm, both reflect sensitizing concepts for studying how worldviews, risk perceptions and disaster planning are related.

Psychometrics and CT have both supporters and critics; however the value of CT to framing this dissertation is that it is so heavily entrenched in culture. Douglas and her collaborators in CT have provided a typology that provides some basic ways individual interpretations of risk and danger involving environmental hazards can be envisioned through the cultural structures which generate a “framework of plural rationalities” about how to interpret and respond to danger (Horlick-Jones, 1995).

In summary, the findings of the literature above provide an overview of the background narrative and research on worldviews and risk perceptions, as they relate to the scope of the
research questions addressed in this dissertation; “How do American Indian worldviews influence risk perceptions for hazards, and how do these perceptions relate to disaster planning?”

As made clear above, both worldviews and risk perceptions are complicated and difficult to define, with many theoretical and methodological variations across various fields of study. Not only are risk perceptions phenomena requiring further investigation (Sjöberg, 2000), worldviews need further exploration as well. While concepts deriving from earlier quantitative Psychometric and Cultural Theory approaches to risk provide numerous sensitizing themes that help frame risk, this dissertation is only indirectly guided by these themes. Psychometrics clearly provides cognitive factors that influence perceived risk in ways that cannot be ignored in any risk perception research, and CT sets the stage for understanding the links between the individual and the group, and how those relations influence perception. But a key contribution of Psychometrics approaches to risk focuses on the distinctiveness of particular hazards to explain risk perceptions (Slovic, 1987). In chapter 4, where the results from the data collected in this project are discussed, the approach parallels this aspect of Psychometrics by focusing on the particular vulnerabilities and hazards faced by the rural and urban samples in the study. However, where Psychometrics tend to assume risk perceptions of lay people are inadequate as interpretations of risk (Flint & Luloff, 2005), this dissertation takes the opposite tack and assumes the perspectives of lay people do indeed capture adequate takes on risk. Although several hazards and vulnerabilities will be presented in the results chapter, the focus on worldview, perceived risk and disaster planning is the mainstay of this research. The indigenous worldview framework elaborated on above was constructed from the voices and perspectives of many American Indian authors, as well as non-Native researchers. As discussed, the framework contains five phenomena that are assumed to be sensitive and relevant to indigenous perspectives.
on experiencing and thinking about the world, explaining outcomes and occurrences in the world, relating to the collective or group, and being in the world through a filter of a holistic perspective. Some of these worldview axes will be addressed in the discussion chapter as well. Below, the methodology, data collection methods, sampling and other aspects of the research process utilized to explore the relationships between the worldviews, perceived risk and disaster planning is a non-representative sample of American Indians are discussed.
CHAPTER 3
DATA AND METHODS

Introduction

The objective of this chapter is to explain how the research questions were explored by presenting the methodology, the data collection methods and data analysis procedures used to understand various dimensions of the most salient categories, themes, patterns and trends in these data that are elaborated upon in the results and discussion chapters to follow. The methodology, methods and procedures used here respond to the need for approaches that can stimulate theoretical innovations to bridge the sociology of disasters, not only with the related fields of risk and environmental sociology, but also with the broader social phenomena of inequality, diversity, and social change (Tierney, 2007). The call by some to apply sociological methods to explore risk perceptions in disaster research in earlier times was stimulated by much the same reasons then as now. In terms of risk perceptions, we need to know how these phenomena are socially constructed, a task suited to qualified sociologists interested in understanding how hazards interact with “psychological, social institutional, and cultural processes” to generate and socially distribute both risks and hazards, and how these processes can amplify or ameliorate perceived risk (Renn et al., 1992; Tierney, 1994, p. 139). Below, the value of sociology in unpacking social phenomenon such as worldviews, risk perceptions and disaster planning is discussed. In addition, the research settings, samples, recruitment methods, research participants, data reliability and validity, reflexivity and the methodological limitations will also be discussed. However, as elaborated upon below, all of the factors and the sensitizing themes and patterns which emerged in the research process were guided by the methodological

The Value of Sociology

One value sociology has in disaster research is that it has a distinctive view on risk that can bring it into closer focus by the methods and systematic methodological and ethical approaches with which sociologists are entrusted. Secondly, sociological qualitative research methods can also deepen our knowledge and understanding of the lives of people by accounting for the details of lived experience in the cultural context, social environment, and individual cognitions that lead to decision making (influenced by one’s worldview) in risk assessment and disaster planning (Eisenman et al., 2007). A third value of using sociology to study risk perceptions, is that the approach focuses on the socially constructed aspects of risk that emerge in the interaction between micro level individuals and larger macro-entities such as social institutions. Individuals are often so embedded in social contexts that it is difficult to clearly see the links between micro and macro; even though it is individuals who perceive risks and danger, it is the socially constructed culture and institutions that shape perceptions, which individuals internalize, thus “becoming part of their worldview and influencing their interpretation of natural [and man-made] phenomena” (Dake, 1992, p. 21). However, individuals generally do not intentionally choose the institutional milieu in the habitus in which they are enmeshed (Bourdieu, 1977). A primary challenge of obtaining information about risk perceptions is that risk itself is unavoidably and ambiguously tied to uncertainty about future events. The very idea of risk dangles freely in the liminal zone between “predetermination and possibility.” If the future were already fixed or predetermined, or completely disconnected from “present human events,” then
the idea of risk “makes no sense” (Jaeger, 2001, p. 17). This makes risk data difficult to obtain. If all the contingencies and potential risks regarding all hazards were completely known then they would not be risks, they would be social facts (Jaeger, 2001). Thus, inquiring about environmental risks, using semi-structured interviewing methods for events that have not happened yet, requires the sociologist to probe beyond the concrete, more surface level of cognition in which most people operate on a daily basis. Risk perception deals with the social construction of reality and theoretical questions of how the world operates (Oliver-Smith & Hoffman, 1999, p. 9). Studying phenomena difficult to define, such as risk perceptions, sometimes requires researchers to access obscure abstract thinking of research participants, especially concerning hazard/disaster risk processes and events that have yet to occur.

### Methodology: Grounded Theory

Instead of the deductive and reductionist approaches of quantitative research that require rigorous theoretical conceptualization prior to data collection, the qualitative methods proposed here will be more inductive, iterative, subjective and exploratory, with a more phenomenological focus. Although the worldview framework provides a modicum of structure with which to explore risk perceptions and disaster planning, the concepts and ideas in the framework are not are admittedly ambiguous and not tightly bound theoretical constructions of rigorous hypotheses of quantitative research. These themes and patterns that emerged from the research process were iteratively derived as data collection and analysis began to coalesce. The epistemological foundation for this research is the naturalistic methods and methodology of grounded theory (Glaser & Strauss, 1967). This approach guided the research methodology, and also provided a clear audit trail of data between the parts of the dissertation research process and product, from
the literature review, sampling, fieldwork, methods, interviews, transcription, memoing, documentation, data analysis, research findings, to the discussion, implications and future directions. Moreover, a grounded theory approach fits well with hazard research with hard-to-reach peoples in marginalized communities, and provides a foundation on which a cogent narrative is built in order to explore the research questions, "How do American Indian worldviews influence risk perceptions, and how do those perceptions relate to disaster planning?"

The source of grounded theory is mostly American in origins, stemming from the pragmatism of James, Dewey, Cooley and Mead, with a particular focus on the looking glass self in which “individuals are self-aware, able to see themselves from the perspective of others and therefore adapt their behavior according to the situation” (Heath & Cowley, 2004; Mead & Morris, 1934). Blumer’s interactionist theory and naturalistic approach had a significant influence on the development of grounded theory, stressing that concepts are more useful as sensitizing phenomena that gain their weight from patterned relationships, at least more so than are quantifiable correlations (Heath & Cowley, 2004). In the history of social theory, Glaser and Strauss developed the methodology of grounded theory in reaction to extreme positivism that had saturated much social science research; the new approach represented a stance against the dominating hegemony of quantitative ideology in the 1960s (Dunne, 2011). Glaser and Strauss challenged the deterministic assumptions of deductive grand theory that sought covering laws for “preexisting and universal explanations of social behavior” (McGhee, Marland, & Atkinson, 2007; Suddaby, 2006, p. 633). Furthermore, they opposed the use of natural sciences in social context because the two fields dealt with different topics. Their grounded theory approach rejects a singular empirical reality. Instead, reality is understood more as a continual
interpretation of significant social factors that focus on perceptions of social life, rooted in “actual productions of meanings and concepts used by social actors in real settings” (Suddaby, 2006, p. 633). Since Glaser and Strauss introduced grounded theory it has been used in numerous fields, including sociology, social anthropology, rural sociology, psychology, educational research, marketing and consumer research, management and organizational research, as well as other social sciences (Bitsch, 2005, p. 80). With so many varied uses of grounded theory in the past quarter century, each innovative field has provided “a new twist, adds ideas, and develops its own techniques,” with grounded theory being called the “master metaphor of qualitative research” (Bitsch, 2005, p. 77). Grounded theory has been used so many different applications that some say its use has moved way beyond its interactionist beginnings to include a “methodological muddle” that occupies the grounded theory landscape (Holton, 2011).

When using grounded theory, data collection, analysis and theoretical conceptualization happens concurrently in ways that the approach generates data rather than relying on specific theoretical content (Patton, 2002). Theories emerge during the research process, from participant-observation and from semi-structured interviews. The research methods of grounded theory involve data collection, note-taking, coding and memoing which all occur simultaneously from the development of the original research question, constantly moving back and forth between varying degrees of discovery mode to varying emphasis on verification mode (Patton, 2002: McGhee et al., 2007). The foundation to grounded theory is that it introduces interplay or a conversation between inductive and deductive aspects of a particular research context. There is methodological flexibility using grounded theory. Unlike most quantitative approaches that spend a lot of time reviewing all the literature on the research topic, and meticulously planning out each stage of the planned research process, there is variability concerning when parts of the
research process, such as the literature review, are to be conducted in grounded theory. For instance, Corbin suggests a thorough early literature review in order to promote theoretical sensitivity and to add supplemental validity to the data, as well as to provide a secondary source of data. Corbin also suggests an early literature review will stimulate further research questions, and help to direct theoretical sampling procedures. Glaser on the other hand, felt the literature review should not take place until the researcher was “in the field and codes and categories begun to emerge” (McGhee et al., 2007, p. 336). The approach taken in this dissertation lies in the middle ground between Corbin and Glaser.

Although many who use grounded theory encourage immediate data collection in order to “discover the nature of the research questions” (Heath & Cowley, 2004, p. 142), researchers disagree on how the researcher becomes proficient implementing the approach. Some favor an external, etic approach that sets a firm foundation through reading about the research phenomena, whereas Strauss felt the researcher should be thrown into the fieldwork and learn about grounded theory by “the process of carrying out research” (Heath & Cowley, 2004, p. 142). The key to building analytical categories and emergent themes are to pull together the data and compare them, thus the most important methods issue behind the grounded approach is to keep running notes through memoing about coding and potential hypotheses throughout the research process (Bernard, 2011). The research process in this dissertation follows Glaser and Strauss here too. Although the researcher was “thrown into the field work,” due to a last minute field site change, the literature review is ongoing and has been conducted prior to, during and after the data had been collected.
Sampling and Setting

The study population for this dissertation project was a sample of 28 American Indians, half of whom reside on a large, rural American Indian reservation on the northern plains and half of whom reside in a large cosmopolitan area in the same region of the United States. In order to perform in-depth research on sensitive topics and hard-to-reach populations (i.e. American Indians), non-probability sampling was used to select the study sample. While quantitative research sampling relies on larger sample size, control over selection errors and the logic and power of random sampling that permits generalization of research findings from a sample to a population, the small sample in this research was selected purposively. Therefore, the data and interpretations from this study are not generalizable to any other group outside the sample itself. However, where sampling bias is a weakness in quantitative research, sampling bias in qualitative research can be strength (Patton, 2002). Instead of the broad overview of statistical analyses, a qualitative approach allows in-depth, on-the-ground study of information-rich cases that permit thick descriptions and requires informed informants, rather than just responsive respondents (Bernard, 2011). This is particularly useful for research topics and populations about which we still know so little.

Initially, the group of people from which a snowball sampling method was to begin, included members of an urban intertribal American Indian center in a city in the Midwest. The researcher has had close ties to some of the tribal elders over the past two decades and planned to conduct interviews with members of the Indian Center at their bi-annual powwow in the fall of 2012. Typical of the challenges of qualitative fieldwork, the Indian Center’s powwow grounds suffered a tornado and strait-line wind storms that leveled old-growth trees and left a wide swath of destruction across the Midwest just prior to the fall 2012 powwow event; the storm also
removed access to a large number of potential research participants. However, as soon as possible a key elder at the mid-western urban Indian Center was contacted via FaceBook, who gave the researcher the name of an American Indian woman in the mid-west who knew many Natives who lived on a rural reservation in the northern plains. The Facebook generated contact said that she knew some American Indians who were interested in disaster research, several of whom were involved in hazard planning and disaster response by serving as EMT’s on the reservation. From an initial contact with an American Indian elder in the mid-west, and through the use of social media, the researcher was led to a family on a tribal reservation in the northern plains, several of whom agreed to participate in an interview. Through interactions with this family, the researcher made contact with and interviewed 14 rural, American Indians enrolled in the Lakota Nation. All of the rural interviews took place at the family home of two husband/wife research participants, Rick (012) and Arlene (002), on the reservation in October of 2012.

The urban sample was also selected through the snowball sampling method. The key informant in an urban center on the northern plains was initially contacted through a former student. In the urban area, Sherrie (024), introduced the researcher to many urban American Indians. Sherrie is very well connected to the urban American Indian community through her long-time residence in the city, through her activism work, and from running a free organic food kitchen at her church for the past 4 years at a local Episcopalian/Native American Church. Through Sherrie (024), another 13 American Indian research participants were enrolled in the study in December of 2012. Most of the urban part of the sample was interviewed in the kitchen area the residential office of an American Indian apartment/townhouse complex in a major city on the northern plains. Of the 28 American Indian interviewees who participated in the research, the sample was split evenly between rural and urban participants. While all 14 of the rural
interviewees reside on a rural reservation in the northern plains states, the 14 urban participants were split between 11 who reside in a city in the northern plains and three more urban participants were from the Dallas/Ft.Worth region of the United States. At the close of each interview, all interviewees were asked for recommendations of other potential respondents as in a chain-referral sampling method. Convenience and chain-referral sampling are particularly good sampling approaches for reaching hard-to-reach, marginalized groups who lack trust regarding outsider researchers, as is often the case with American Indian populations (Bernard, 2011). The sampling sources above provided maximum variation aimed at capturing and describing the most salient and central themes or social phenomena associated with risk perceptions of such heterogeneous race/ethnicity grouping called American Indians (Patton, 2002).

Confidentiality

In order to protect the rights of the research participants, an IRB approved informed consent form (see Appendix 1) was discussed and reviewed with each research subject as enrolled in the study prior to an interview. The identity of each study subject has been protected by coding each participant with a separate alpha-numeric identifier. In order to maintain the confidentiality of the research participants any names used throughout this dissertation are aliases, intended to give the research participant a sense of identity and character, as well as anonymity. The code book has been protected in an off-campus locked location and stored in a locked file cabinet in a locked office. All interviews were recorded using a digital voice recorder (as well as a back-up device) and transcriptions of interviews were performed. Transcripts were entered into the on-line mixed methods research program called “DeDoose” and then coded
thematically. To ensure internal validity of interview data, at the end of each interview each
study subject was debriefed regarding the clarity of the research questions and their responses.
To track the research process there has been a transparent audit trail in which each research
subject has a mutually exclusive case report file and alpha-numeric designation. For each
interview, participant-observation session, significant interaction, or documents collected during
the field work process, there is a correlated summary form. These forms allow for easy
organization of data captured in the field; each form identifies each event or process and allows
for primary descriptions of interviews, observations, interactions, and documents encountered in
field work. Further, these forms provide for initial data analysis by listing the main themes of
the event and the most salient, important or interesting thematic or patterned aspects of research
processes. The research summary forms also have a section to note new research questions
and/or suggestions for shifts in the research process.

Research Participants

The participants in this research were generally divided into a rural reservation group, all
of whom are enrolled in the same Lakota Tribe, and an urban group, comprised of more tribal
diversity than the reservation sample. The urban research participants were from various
American Indian Nations, including Lakota Sioux, Ojibwe, Blackfoot, Navajo, Omaha, Zuni
Pueblo, Cheyene, and Chikesaw. Although there are many distinctions between American
Indians residing in rural and urban areas, division of the participants into the two regions (rural
& urban) was chosen because many Natives traverse the continuum of both environments.
Although the conventional perspective of American Indians is that they live on rural reservations
in the western U.S., many American Indians live in urban areas as well. The trend between 1945
and 1968, based on termination of federal assistance to many tribes and emphasis on relocation from rural to urban areas, has been increasing urbanization of many American Indian peoples (NCAI). By 2010, the U.S. Census reported that 71% of American Indians live in urban locations, up from 67% in 2000, 45% in 1970 and only 8% in 1940 (Williams, 2013). As this dissertation will show, even though more American Indians live in urban areas than in rural reservation communities, many urban Natives maintain close connections to reservation communities in which they are enrolled or connected to through kinship. Nonetheless, it is important to remember that “‘urban’ is not a kind of Indian. It is an experience, one that most Indian people today have had” (Lobo & Peters, 2001, p. 81). The distinction between rural and urban communities is also important in terms of risks associated with the two different areas. We still do not know whether a rural or urban area is more vulnerable in a disaster event. Some authors suggest people in rural communities are more vulnerable than people in large cities because of less preparedness, more isolation and less training for rural hazard mitigation and response involving just a few part-time, often volunteer support services (Cross, 2001). Others say large urban areas are especially vulnerable because destruction of communications systems and infrastructure can have a wide scale impact (Kumpulainen, 2006). Moreover, marginalized communities, such as poorer American Indian groups living in an urban context, are at higher risk for the impacts of hazards or disasters than are non-Indians (Wisner, 2004). Thus, rural and urban samples were selected for this research because specific data on American Indian risk perceptions are missing in the disaster literature for both groups. Disaster researchers, planners and policy makers need to know how marginalized groups perceive risks, hazards and disasters in order to reduce losses (Viscusi & Zeckhauser, 2006). Without explanatory baseline data on how American Indians perceive risk, it is simply unknowable what can be done to prepare for
disasters, much less how tribal planning efforts may be integrated with larger emergency management systems. This research seeks to address this deficiency by contributing to knowledge about American Indian interpretations of environmental risks and dangers.

Table 3.1

Demographics

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (mean)</strong></td>
<td>35.6 years</td>
<td>52.2 years</td>
<td>43.9 years</td>
</tr>
<tr>
<td><strong>Age (range)</strong></td>
<td>18-61 years</td>
<td>24-69 years</td>
<td>18 – 69 years</td>
</tr>
<tr>
<td><strong>Gender/Sex (women)</strong></td>
<td>57.1% (8)</td>
<td>93% (13)</td>
<td>75% (21)</td>
</tr>
<tr>
<td>&lt; High School Diploma</td>
<td>35.7% (5)</td>
<td>14.0% (2)</td>
<td>25.0% (7)</td>
</tr>
<tr>
<td>High School Diploma</td>
<td>29.0% (4)</td>
<td>21.4% (3)</td>
<td>25.0% (7)</td>
</tr>
<tr>
<td>Some College</td>
<td>14.0% (2)</td>
<td>21.4% (3)</td>
<td>17.8% (5)</td>
</tr>
<tr>
<td>Associates Degree</td>
<td>00.7% (1)</td>
<td>14.0% (2)</td>
<td>10.1% (3)</td>
</tr>
<tr>
<td>Bachelors Degree</td>
<td>00.7% (1)</td>
<td>29.0% (4)</td>
<td>17.8% (5)</td>
</tr>
<tr>
<td>Began Masters Degree</td>
<td>00.7% (1)</td>
<td>00.0%</td>
<td>03.5% (1)</td>
</tr>
</tbody>
</table>

As noted in Table 3.1, for the overall population of rural and urban research respondents the mean age was 43.9 years (range = 18-69 years old), however the mean age for only the urban group was 52.2 years old, while the mean age for the rural group was much lower (mean rural age = 35.6 years of age). An overwhelming number of urban respondents (93%), and the total study population as a whole (75%) were women, whereas in the rural group, over half (57%) of the respondents were women. Only 1 of the 14 urban Indians was male. Thus, the urban part of the sample was older and contained more females. The educational levels of the rural and urban samples varied. In terms of educational level achieved, on the reservation, 9 of 14 respondents
reported having a either earned a high school diploma or having less than a high school diploma, but considering formal and informal services to the community it is easy to see that social networking of many of the participants extends beyond the various roles and statuses of those in the reservation part of the sample. Some of the less formally educated respondents worked as firefighters, EMT’s, first responders, ambulance supervisors, community organizers, and activists for local social causes in terms of tribal interests. Those that attended some college earned an associate’s degree or got their bachelor’s degree and began graduate school, bringing much needed untapped social capital to the reservation community. In the urban sample, most had at least earned a high school diploma, while others had gone onto seek and earn college credit and degrees in seminary, psychology, art, social work, microbiology, para-legal work and elementary education.

Table 3.2

*Research Participant Descriptions*

<table>
<thead>
<tr>
<th>Participant/Alias</th>
<th>Region</th>
<th>Tribe</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>001. Diedra</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>55-64 (61)</td>
<td>Some College</td>
<td></td>
</tr>
<tr>
<td>002. Arlene</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>45-54 (52)</td>
<td>H.S. Diploma</td>
<td>EMT/1st Responder</td>
</tr>
<tr>
<td>003. Randy</td>
<td>Rural</td>
<td>Lakota</td>
<td>Male</td>
<td>35-44 (43)</td>
<td>Assoc. Deg</td>
<td></td>
</tr>
<tr>
<td>004. Lisa</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>25-34 (28)</td>
<td>Some College</td>
<td></td>
</tr>
<tr>
<td>005. Karen</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>45-54 (49)</td>
<td>Began Masters</td>
<td>Suicide Prev.</td>
</tr>
<tr>
<td>006. Karla</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>18-24 (22)</td>
<td>H.S. Diploma</td>
<td></td>
</tr>
<tr>
<td>007. Gina</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>18-24 (18)</td>
<td></td>
<td></td>
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<tr>
<th>Participant/Alias</th>
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<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Training</th>
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<td>008. Leonard</td>
<td>Rural</td>
<td>Lakota</td>
<td>Male</td>
<td>25-34</td>
<td>&lt; H.S. Dipl.</td>
<td>1st Responder</td>
</tr>
<tr>
<td>009. Nancy</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>25-34</td>
<td>&lt; H.S. Dipl.</td>
<td></td>
</tr>
<tr>
<td>010. Lawrence</td>
<td>Rural</td>
<td>Lakota</td>
<td>Male</td>
<td>25-34</td>
<td>&lt; H.S. Dipl.</td>
<td>Organizer</td>
</tr>
<tr>
<td>011. Teresa</td>
<td>Rural</td>
<td>Lakota</td>
<td>Female</td>
<td>35-44</td>
<td>&lt; H.S. Dipl.</td>
<td></td>
</tr>
<tr>
<td>012. Kevin</td>
<td>Rural</td>
<td>Lakota</td>
<td>Male</td>
<td>45-54</td>
<td>H.S. Diploma</td>
<td>EMT/Fire/1st Responder</td>
</tr>
<tr>
<td>013. William</td>
<td>Rural</td>
<td>Lakota</td>
<td>Male</td>
<td>25-34</td>
<td>H.S. Diploma</td>
<td>Fire ICO/1st Responder</td>
</tr>
<tr>
<td>015. Deborah</td>
<td>Urban</td>
<td>Ojibwe</td>
<td>Female</td>
<td>55-64</td>
<td>Some College</td>
<td></td>
</tr>
<tr>
<td>016. Rita</td>
<td>Urban</td>
<td>Lakota</td>
<td>Female</td>
<td>35-44</td>
<td>Assoc. Deg.</td>
<td></td>
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<tr>
<td>017. Samantha</td>
<td>Urban</td>
<td>Ojibwe</td>
<td>Female</td>
<td>65-74</td>
<td>Some College</td>
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<tr>
<td>018. Justine</td>
<td>Urban</td>
<td>Ojibwe</td>
<td>Female</td>
<td>55-64</td>
<td>Some College</td>
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<tr>
<td>019. Linda</td>
<td>Urban</td>
<td>Lakota</td>
<td>Female</td>
<td>65-74</td>
<td>Some College</td>
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<tr>
<td>020. Pamela</td>
<td>Urban</td>
<td>Lakota</td>
<td>Female</td>
<td>65-74</td>
<td>Bachelor Deg.</td>
<td>Para-Legal</td>
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<tr>
<td>021. Marjorie</td>
<td>Urban</td>
<td>Ojibwe</td>
<td>Female</td>
<td>65-74</td>
<td>Bachelor Deg.</td>
<td>Episcopalian Clergy</td>
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<tr>
<td>022. Blizzard Bill</td>
<td>Urban</td>
<td>Lakota</td>
<td>Male</td>
<td>45-54</td>
<td>Bachelor Deg.</td>
<td>Comm. Org./Activt</td>
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<tr>
<td>023. Wanda</td>
<td>Urban</td>
<td>Ojibwe</td>
<td>Female</td>
<td>55-64</td>
<td>H.S. Diploma</td>
<td></td>
</tr>
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*(table continues)*
### Table 3.2 (continued).

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<th>Participant/Alias</th>
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<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Training</th>
</tr>
</thead>
<tbody>
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<td>024. Sherrie</td>
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<td>BlackFoot/Navajo</td>
<td>Female</td>
<td>55-64</td>
<td>Bachelor Deg.</td>
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</tr>
<tr>
<td>025. Lori</td>
<td>Urban</td>
<td>Omaha/Lakota</td>
<td>Female</td>
<td>35-44</td>
<td>Bachelor Deg.</td>
<td></td>
</tr>
<tr>
<td>026. Amy</td>
<td>Urban</td>
<td>Zuni Pueblo</td>
<td>Female</td>
<td>18-24</td>
<td>Job Developer</td>
<td></td>
</tr>
<tr>
<td>027. Celia</td>
<td>Urban</td>
<td>Cheyene</td>
<td>Female</td>
<td>25-34</td>
<td>Assoc. Deg.</td>
<td>Med Record tech</td>
</tr>
<tr>
<td>028. Sylvia</td>
<td>Urban</td>
<td>Chickesaw/Navajo</td>
<td>Female</td>
<td>35-44</td>
<td>Some College</td>
<td>Nurses Aide/Job Dev.</td>
</tr>
</tbody>
</table>

**Methods: Semi-structured Interviews**

All 28 of the research participants were interviewed using a semi-structured interview guide (see below). All interviews were digitally recorded after obtaining informed consent and then transcribed for analysis. As the interviewing process began many of the interviewees provided data that not only addressed the questions in the interview guide, but also provided insights into other areas. Quite often after introducing the research topic through the informed consent process, and initial rapport building questions regarding participant’s residence, tribal enrollment/affiliation, age, educational experiences, the research participants directed the course of the conversation. However, a key goal was to elicit, if possible, a story in which the interviewee had experienced a man-made or natural disaster; from these, the objective was to obtain data regarding perceptions and interpretations of risk and danger before, during and after a disaster event. To begin, interviewees were asked what kinds of environmental threats they were potentially exposed to in the region in which they live. This question often led directly to the research participant telling a story about a disaster/hazard experience in which they, or someone...
they knew well, were in danger. Stories about various vulnerabilities and physical hazards were elicited to capture basic information about the environmental risk milieu in which the research took place. Knowing how specific environmental natural and man-made hazards interact with other socio-economic, political and cultural vulnerabilities provides a base-line understanding of the environment in which risk perceptions are constructed in the rural and urban samples.

Other factors addressed by the interview guide include common themes in the sociology of disasters, information about how the research participants communicated about risk, household disaster planning, reliance on social networks, perspectives on origins of disasters, the link between human behavior and the rise in disasters. Finally, if the interviewee had not already made this clear, they were asked about risk perceptions regarding particular hazard scenarios, as well as how American Indian worldviews may or may not differ from the worldviews of non-Indians. For example, when asked about tribal affiliation and involvement in tribal affairs, the research participants often discussed an American Indian worldview as not only having a large focus on the human relationships in the natural world, but also more of an idea or spirit-as-the-first-principle, based perspective (Obasi et al., 2009). This is ontologically and epistemologically different from the more material-based, dominant social paradigm of the Western worldview (Dyer, 1993; Duran & Duran, 1995), thus some of the interview questions are designed to elicit information about ontological similarities and differences between Western and an American Indian worldviews. Information about the relationship between the individual interviewee and a tribal group was also queried regarding their social bonds to an American Indian community. For instance, the interview guide probed interviewees about their sense of tribal bonds and mutualities that they may or may not maintain through different types of interdependencies, expectations, obligations, and interactions that take place and serve to “ensure
social order” (Jaeger, 2001, p. 15; Giddens, 1984). Questions about the relationship between humans and nature/the environment, and about how risky the world appears to be, were paired together in order to elicit responses that could help the researcher understand how the research participant’s worldview accounted for the relationship between humans and the natural world, a key factor distinguishing a Western worldview from an American Indian worldview as noted in the worldview literature above.

*Semi-Structured Interview Questions/Guide*

1. Tell me about yourself, like where you grew up.

   *Probes:* on American Indian reservation, urban, suburban

2. Tell me about your American Indian heritage/ancestry, Tribal affiliation.

   *Probes:* Which American Indian Nation; Tribal enrollment status; Involvement in Tribal matters, Family structure, Who close to/why? Go to family reunions, community events, powwows, social religious/spiritual events? Consult spiritual leaders/participate in what types of ceremonies?

3. What kinds of environmental hazards, dangers or possible disasters are you exposed to where you live?

4. How do you hear information about potential hazards/disasters where you live?

   *Probes:* Source? (Friends, neighbors, family, Internet, TV, media) What makes you take a hazard threat seriously?

5. What type of disaster plan do you have in place?

   *Probes:* Feel Prepared? Have a disaster kit? Household/Family Plan, Know Evacuation Routes/Nearest Hospital, Tribal or Indian Center plan, who would you contact in an emergency?

6. Who would you rely on if a disaster happened?

   *Probes:* Self, Family, Tribe, State, Federal authorities? Would you evacuate if the local, state or federal said to? Trust authorities?

7. Have you/someone close to you, ever been involved in a disaster? Tell me about that experience.
Probes: Hurricane, Earthquake, Tornado, Blizzard, Flood, Fire, Drought, Illnesses, War, Chemical spill, Car Accident, Terrorist attack; How did you prepare? What happened before, during and after the disaster experience?

8. Where do you think disasters come from?

   Probes: What causes disasters?

9. What’s the relationship between man-made disasters and natural disasters?

10. How do you explain the rise natural and technological disasters in the last several decades?

11. Tell me about how you see the world in a broad way; what’s your worldview?

   Probes: Refer to WV framework

12. Tell me about how you view the relationship between humans and nature/ the environment.


13. Tell me about how you see the idea of risk in the world.

   Probes: High/low risk place, is the world a dangerous place?

14. Tell me about how your sense of safety or danger in the world? Is the world a safe place, how so?


Data Analysis

Data analysis involves conversion of raw data into conceptual categories (Suddaby, 2006). Initial analysis was begun by operationalizing and determining the analytical categories associated with worldviews, risk perceptions and disaster planning. These analytical categories served as pre-codes for data analysis. Coding was an on-going and flexible process that drew on
interview data, participant observations, the literature and from conversations with many American Indians. The first coding process followed the semi-structured questions above and included codes for phenomena such as demographic data, local environmental hazard types, how the interviewee communicates about hazards, what sort of disaster plan or kit they have in their household, who they would rely on in an emergency, their disaster experience story, what they think about human and natural origins of hazards/disasters, what they think about the relationship between humans and nature, as well as risk in the world, safety or safeness in the world. In addition, these data were coded for examples of Western and American Indian (indigenous) worldviews according to the worldview framework presented in the literature review which included ways of experiencing, thinking about, explaining, relating to, and being in, the world (Duran & Duran, 1995). The results chapter below presents the research findings from the interviews regarding the worldview framework to address the research questions, “How do American Indian worldviews influence interpretations of risk and danger in terms of environmental hazards or disasters? and How do these risk perceptions relate to disaster planning?” Following the findings from the worldview framework, risk perceptions and planning are presented in terms of the other most salient themes that emerged during analysis: vulnerability and local hazards, communication, disaster planning, trust, and the experience of living in two worlds.

With these themes in mind, these data were pulled together in categories, those categories were repeatedly compared and the relations among categories were explored for patterns. After thorough immersion in interview transcript data, and using a naturalistic approach incorporating the “words of real people,” further development of these data occurred iteratively (Bernard, 2011, pp. 492-3). Interview quotations were used as evidence to support, exemplify and
elaborate research findings related to the main research questions regarding the relationships between an indigenous worldview, risk perceptions and disaster planning, as well as to point the research towards theory considerations if appropriate. Once the themes were culled from the data, a meta-matrix (Miles & Huberman, 1994) was created from the interview transcripts and participant-observation notes. The matrix included only the most representative data (quotations, events, meanings) that depict the foremost themes that emerged during the coding process. From this matrix, only the most relevant parts were used to present ideas and support conclusions. The key goal of a meta-matrix approach is to assemble a master chart of descriptive data in a standard format. This can be displayed as a “monster dog” (Patton, 2002), a large spread sheet based on the principle of inclusion of all relevant data in a table of cases and associated variables. From the stacking-up of the data, analysis was gradually refined, summarized and ranked according to the various codes and themes. Once the chart began to fill with interview quotations (and field note information from participant-observation sessions), these data was further partitioned by dividing them in new ways. Next, the data were clustered and grouped together in order to clarify contrasts regarding sets of cases, and in order to get a clearer picture of how the various phenomena interact with each other. Through this method, entries in the monster dog spread sheet can further transform case level data derived from transcripts by telegraphing them into summarizing phrases, ratings, rankings and even symbols (Miles & Huberman, 1994).

Reflexivity

As researchers develop a topical interest, begin to collect data and to cull out the most significant themes, a sort of open-mindedness reflexivity sometimes ensues in which the researcher attempts to “ensure that data are not ignored because they do not fit in with a
preconceived notion” (McGhee et al., 2007, p. 335). The need for objectivity and the use of the post-positivist ontology of grounded theory influences researchers by forcing them to always grapple with bias due to close association with, or proximity to, the research context and the research participants. The constant comparison methods of grounded theory requires self-awareness and a “consciously reflective process” in which researchers turn-back their gaze onto their own life experiences, roles, statuses, and other social involvements that could bias the data collection and its interpretation (McGhee et al., 2007, p. 335). When there are disaster events, the lack of immediate access to non-durable data makes data collection difficult to obtain, often requiring researchers to move out of their social comfort zone, constantly adapting to circumstances in the field in order to “fit-it” with the social context of the research participants. This also requires the researcher to invoke a significant amount of reflexivity in which the biases of both researchers and study participants can be addressed. In order to understand the relationships between American Indian worldviews, risk perceptions and disaster planning, grounded theory (Glaser & Strauss, 1967) proved very useful because it permitted the requisite flexibility to deal with research problems encountered in the field by allowing for methods alterations that align with changing circumstances, thus allowing research questions and theory to be driven by research methods (Killian, 2002).

Reliability and Validity

Reliability is related to whether a technique or instrument used to measure a phenomenon “applied repeatedly to the same object, would yield the same result each time” (Babbie, 2005, p. 145). In this research project, reliability is connected to how well the semi-structured interview guide repeatedly yielded appropriate information to answer research questions related to
worldviews, risk perceptions and disaster planning. As the interviews unfolded the interview guide and the probes elicited some similar types of information across the interview sample, though much data varied along some axes. Thus, the content of the interview guide was used consistently with almost every interviewee. However, when the interviewee elaborated on a prominent theme related to worldviews or risk perceptions that had not been encountered in earlier interviews, the research participant was encouraged to further discuss their ideas in order to follow the interviewees into other parallel concepts, themes or patterns.

Validity is a term that is used to describe how well a measure reflects the concept it is intended to measure, either internally or externally. However ultimate validity of a measure cannot be achieved (Babbie, 1990). Validity is part of all scientific analytic endeavors, but in qualitative research validity is difficult to achieve and emerges through carrying out the qualitative process itself when the data are analyzed and the results and interpretations stand up to scrutiny (Hesse-Biber, 2011). Validity is tied to the “accuracy and trustworthiness” of the data collection instruments, the data, the research findings and the interpretation of research findings (Bernard, 2011). Validity in qualitative research has been established in a wide variety of fashions, however no single definition attains hegemonic status in qualitative research. Internal validity is supposed to support the credibility of the research processes and outcomes and has been described as the “truth value, applicability, consistency, neutrality, dependability, and/or credibility of interpretations and conclusions within the underlying setting or group” (Onwuegbuzie & Leech, 2007). Internal credibility corresponds to what Onwuegbuzie termed internal replication in quantitative research. External validity or credibility refers to the degree that the findings of a study can be generalized across different populations of persons, settings, contexts, and times. That is, external credibility pertains to the confirmability and transferability
of findings and conclusions” (Onwuegbuzie & Leech, 2007, pp. 234-235). In order to better understand worldviews, risk perceptions and disaster planning in the American Indian sample selected here, the following chapter describes several of the most salient themes that emerged from the data captured through applying a grounded theory methodology, and the qualitative methods described above. Below, the worldview framework will be addressed first, followed by other themes that relate to worldviews and risk perceptions not addressed in the worldview framework.
CHAPTER 4
RESULTS

Introduction

This chapter presents some of the most salient research findings captured during October and December of 2012 from semi-structured interviews completed with a sample of rural and urban American Indians from northern plains state in the United States. First, the research questions, “How do American Indian worldviews influence risk perceptions for environmental hazards?” and “How these perceptions influence disaster planning?” is addressed by exploring the relationships between these phenomena in terms of the worldview framework constructed for analytical purposes. Secondly, other factors that influence risk perception and planning is presented. Following that, the discussion in chapter 5 attempts to explain some of the variation in the study results.

To address the research questions, “How do American Indian worldviews relate to risk perceptions? and “How do these perceptions relate to disaster planning?,” each axis in the worldview framework can be conceptualized as consisting of three interrelated phenomena; a worldview perceived risk and planning. The first phenomenon reflects an aspect of an American Indian worldview as discussed in the literature review. The second phenomenon addresses perceived risk as having an assumptive relationship with the first phenomenon (indigenous worldview). The third phenomenon, disaster planning, is assumed to be tied to the first two phenomena. The words of research participants who expressed affinity for the various axes of the indigenous worldview framework, were also analyzed for some aspect of the second phenomenon (risk perception), which in turn were analyzed for a relationship with disaster planning. In other words, each of the interrelated phenomena in the research questions were
addressed by using a funneling approach in which we seek a preliminary understanding of the relationships between American Indian worldview, risk perceptions and disaster planning for the research sample. Below, individual quotes have been culled from the interview transcripts which relate to each axis of the worldview framework, risk perceptions and disaster planning. In addition, each axis of the framework is explored in terms of comparing risk perceptions and disaster planning between the rural and urban groups in the sample.

Application of the Worldview Framework

*Experiencing the World: Time and Space*

To address the relationship between having an indigenous perspective on time and space, perceived risk and disaster planning, the worldview axis (time & space), risk perception and planning were unpacked in the following manner. Since time and space are often so interconnected in indigenous worldviews, the perceived risk of the *end* of time and space are assumed to be linked as well. Although a Western worldview generally casts time as having an uncontrollable deterministic outcome as in the idea of the Christian end times, and Americans Indians tend to view time as more circular or a blend of coiled-circle and line (Suzuki & Knudtson, 1993), the two do share a common idea. In both there are larger ontological forces at work that could increase a sense of danger or risk perception about the fate of the world. These themes include end-times-like, or end-of-a-natural-cycle types of forecasts for the future of the planet. Perceiving the risk to be high for the destruction of the world through some sort of end-times scenario was evident in both the rural and urban groups. For example, rural interviewee, Arlene (002), related an American Indian end times story to increasing frequency and magnitude
of natural disasters, as told by her grandfather, a story that has remained with her since childhood.

When I was real little, my grandfather told us that this world was gonna end some day and that we would see things. The earth would eliminate the people because at one time there’s gonna be too many of us on this land. There’s gonna be too many of us, and so naturally it eliminates. He told us that the ‘Oyate,’ the people, when there’s too many of us that it’s gonna always [lead to] a natural disaster, not man-made but God-made. That stuck in my head.

-Arlene, 002- 52 year old rural Lakota Woman, EMT/First Responder

In more of Christian/American Indian vein, Celia, a 27 year old Cheyenne woman residing in an urban center in Texas described how her mother’s Christian views heighten her anxiety about risk for some sort of dangerous end times. Celia said, “My mom’s actually pretty religious. I’m not, but, listening going to her meetings and stuff like that, they always talk about how the shit’s going to hit the fan at the end of the world and all these natural disasters are going to happen and I guess that’s what makes me think of it, the end of the world. I know there’s always been natural disasters, but it just feels like there’s been more in my life time.” Still others in the sample saw an end-times coming in less destructive form, as in a regenerative change in a natural cycle. For example, Deborah, a 50 year old, urban Ojibwe woman said of the end-times idea is association with the supposed end of the Mayan calendar, "I don’t really believe that like things are going to end. I don’t believe it’s happening. I think a new calendar will begin."

Framing the fate of the world in such larger forces could possibly externalize one’s locus of control in the world, thereby providing a coping mechanism through which individuals can avoid discomfort or dissonance when thinking about hazards and disasters (Case, Andrews, Johnson, & Allard, 2005). However, perceiving the risk to be fairly high that some sort of end times is imminent in the near future may also inhibit disaster planning by promoting a sense of ontological ambivalence. Ontological ambivalences was addressed through Question 10 on the
interview guide, “How do you explain the rise in natural and technological disasters in the last several decades?” Those expressing a belief that the recent rise in hazards and disasters is the result of either “God’s will” or as part of a larger cycle of nature in which a person lacks much control over, were identified as expressing a sense of ontological ambivalence. This theme is notable in the following quotes from the two research participants below.

We can’t predict natural disasters. We can’t control them. We can’t be prepared all the time for them. It is in God’s hands, you know. Or whoever’s hands they are. If it’s gonna happen, it’s gonna happen. We’re never really ready, and it’s in God’s hands, and it’s nature, you know? Now it’s the man-made disasters you have to worry about. My belief is that they’re gonna make it to where we ain’t gonna be prepared.

-Teresa, 011- 36 year old rural Lakota Woman

It’ll come when it comes, and it won’t when it won’t. When things happen, they’re supposed to happen. If we were, you know, for instance the flood [at the Indian Center], when it happened, we were all devastated, we were all worried if we were going to have jobs the next day, but nobody ever said, “I wish this never happened.” Nobody ever said, “Oh, I hate the fact that this happened.” Because it was an understanding, that it was supposed to happen. You just take what you have and you go with it.

-Amy, 026- 24 year old urban Zuni Woman

Disaster planning was addressed by Question 5 on the interview guide that asked, “What type of disaster plan do you have in place?” Those who reported having at least a household disaster kit containing a variety of necessities such as food, water, medicine, blankets, flashlights, batteries, etc at hand were identified as having planned for disasters. Below, Table 4.1 presents the frequency of response by the research participants regarding the phenomena in the first axis of the worldview framework.

Table 4.1

<table>
<thead>
<tr>
<th>Phenomena Discussed</th>
<th>Rural Group</th>
<th>Urban Group</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience indigenous Time/Space</td>
<td>71% (10 of 14)</td>
<td>71% (10 of 14)</td>
<td>71% (20 of 28)</td>
</tr>
<tr>
<td>Ontological Ambivalence/Acceptance</td>
<td>80% (8 of 10)</td>
<td>100% (10 of 10)</td>
<td>90% (18 of 20)</td>
</tr>
<tr>
<td>Disaster Planning</td>
<td>75% (6 of 8)</td>
<td>30% (3 of 10)</td>
<td>50% (9 of 18)</td>
</tr>
</tbody>
</table>
While it is clear that all parts of the first axis in the worldview construct, risk perception (and a sense of ambivalence) and disaster planning exist in the individual perspectives of the rural and urban research participants, but to get a clearer understanding if there are differences in how this worldview axis relates to risk perception and disaster planning between the rural and urban groups, their responses were grouped in terms of the “funneling” approach described above.

As noted in Table 4.1, nearly three-quarters (71%) of the entire sample described their perceptions of time in ways aligned with the indigenous constructs mentioned above. Of those holding an indigenous view of time/space, 80% of the rural group, 100% of the urban group, and 90% of the sample as a whole, described the ultimate outcome of time/space in terms of an uncontrollable and likely destructive “end.” Of those respondents who expressed time/space in an indigenous way, and also perceived a likelihood that the end times may occur soon (which is assumed to cause ambivalence towards disaster planning), only a large number of the rural group (75%) actually reported having appropriate disaster planning kits in their household; less than 1/3 of the urban group and only half of the sample as a whole, reported doing appropriate disaster planning.

These data seems to suggest there is some sort of relationship between experiencing time/space in an indigenous way, and having a sense of high risk and ambivalence about the fate of the world, and between ambivalence and disaster planning, at least for the rural group. However, this does not hold for the urban group or the sample as a whole. Overall, disaster planning was much higher for the rural than the urban group, suggesting that planning for disasters may be more linked to where an individual resides, rather than whether they experience
time and/or space from an indigenous perspective and also express a sense of ambivalence about the fate of the world.

In terms of the relationship between this axis of the worldview framework, perceived risk and disaster planning, looking to the future outcome of time and space for the world does seem to influence risk perception in a way that is associated with ambivalence towards planning. Yet, many ideas about the future of the world expressed in the sample cannot be said to be truly only related to some sort of essentialized aspect of Indianness. The ideas about the future of the world expressed by respondents seem very similar to the diverse groups with which the American Indian Diaspora interact. American Indians are exposed to not only traditional ideas of the end of time as a form of renewal, but also to Christian ideas of the apocalyptic end, as well as to a wide range of other ways of seeing time and space in everything from popular New Age culture and science fiction, and fiction, to scientific discourses. Nonetheless, perceptions of time varied widely in the sample, from micro level pragmatism to the end of human civilization. For instance, after attending his Sunday sermon in which urban interviewee “Blizzard Bill,”(022) preached about the “end-times,” the Lakota Episcopalian minister was asked to clarify what that meant and his response was very practical. He said, “when I think about that whole thing about the end times, it’s more in relation to our own mortality. It’s like, we’re all gonna die. So like in some ways that is the end, of this world.” On the other hand, when asked about the rise in disasters in recent times, some Indian respondents said this indicated that Christ’s imminent return was at hand, while others like Sherrie (024), a 61 year old mixed Blackfoot and Navajo woman said the riskier environment indicates an end of a natural cycle in which the dangers of humanity are rebuffed. Sherrie said, “Everything is a cycle ya know; the sun rises, the sun sets.
If you look, you see this everywhere, but I don’t think this is the first civilization that has been in the process of destroying itself.”

*Thinking about the World: Content and Process Merit*

In the second axis of the worldview framework, an indigenous approach to thinking about the world is assumed to be rooted in two types of legitimating concepts. These concepts include having both content merit and state merit regarding a range of phenomena, from perceptions of risk, to knowledge and awareness, to assumptions, beliefs, behaviors, practices or ceremonies. Legitimate process thinking exhibits content and state merit in the following ways. Content merit involves any given action or belief practice that appears to be reasonable, relevant or sufficient to the task at hand or knowledge/understanding proffered. State merit is achieved when one portrays ethical acceptability in terms of how they came to learn knowledge and processes (DuFour, 2004). It is assumed that expressing a tendency towards a more indigenous type of process type thinking that contains content and state merit, would reflect using critical thinking skills when thinking about risk and planning. If one thinks critically about the environment it seems a small leap to assume this may be related to hazard awareness in one’s local environment, which subsequently may be tied to decisions to do household disaster planning.

To explore the links between the phenomena of indigenous process thinking, hazard awareness and disaster planning, these phenomena were unpacked as follows. During the interviews the concept of process thinking (containing both content and state merit) was not queried directly. Many of the responses that emerged regarding process thinking came from asking Question 2, “Tell me about your American Indian heritage/ancestry and tribal affiliation.”
This question was broad enough to allow respondents time and interview space to elaborate upon on social and cultural belief practices that exhibit process thinking. Still other contexts in which content and state merit were evident emerged at random spots throughout the interviews. Many of the processes that were included as containing content and state merit involve ceremonies; over 90% of the sample reported participating in tribal ceremonies at various times in their lives. For example, Arlene (002), a long time EMT on the reservation described participating in the sweat lodge ceremony to cope with the trauma she experienced while working as an EMT. In the following quote, Arlene (002) depicts content merit of the ceremonial process in that it is reasonable, relevant and sufficient to the context of maintaining mental health in the face of trauma, and it has state merit in that the ceremonial process entails an ethical acceptability in terms of the ancient tribal process has been vetted as valid over generations of use. Arlene said;

> With my cultural religion, I pray a lot and going through experiences. I will take go and take care of myself. I’ll go sweat, whatever it takes to make myself strong, so that I don’t carry that. With what I’ve experienced, and not having that, I don’t think I, I don’t think I could have survived out there with all the things that I seen, with suicide. I mean I’ve seen hangings and I’ve seen gun shots, my first gunshot I couldn’t sleep, so I knew what I had to do. The next day at daybreak I just prepared myself. I knew where they where gonna have one [a sweat lodge] so I went out just told what I’m there for so they helped me. So that’s how I survived it, you know a lot of people wanna know and I tell them, “I use my religion.”

In an educational vein, Sherrie, a 61 year old mixed Blackfoot and Navajo urban Native woman, expressed content and state merit in the teaching methods she uses when teaching American Indian children about the natural cycles of the Earth. Sherrie said,

I was working on a project to encourage Indian children to seek careers in science. One of the things we did was a scavenger hunt, but you couldn’t take anything. The scavenger hunt was with your eyes and your ears, your senses, but isn’t that the basis of science, observation? But you take a baggy and you tie it around the leaf of a living tree and then you come back later and you’ll see water condensed inside in the baggy. So basically, all the exercises, all the little scientific experiments we did were to get them to see the whole circle, to understand that, yes this plant, you know, the rain comes down, the plant is taking up the rain and the moisture is coming back out through the leaves.
You know, I didn’t have to tell them that there was a cycle there. By doing these thing, they told me that there was a cycle there.

Content merit (relevance) is noted in Sherrie’s words in that teaching science to American Indians is sufficient to the desire and need for education in so many American Indian communities. State merit is evident in the how the process of doing science to learn scientific concepts is a form of active learning, a process long valued by many American Indian communities.

Awareness of local hazards was determined by assessing the range of hazards discussed by the interviewees. As with Axis 1 above, disaster planning was determined as an interviewee having at least a household disaster kit on hand, which in some cases was supplemented by other mitigation activities. Table 4.2 presents frequency of responses by the research participants regarding the three phenomena addressed in Axis 2 in the worldview framework.

Table 4.2

<table>
<thead>
<tr>
<th>Phenomena Discussed</th>
<th>Rural Group</th>
<th>Urban Group</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Thinking w/content/state merit</td>
<td>79% (11 of 14)</td>
<td>64% (9 of 14)</td>
<td>71% (20 of 28)</td>
</tr>
<tr>
<td>Hazard Awareness (diversity of hazards mentioned)</td>
<td>3-13</td>
<td>3-15</td>
<td>3-15</td>
</tr>
<tr>
<td>Disaster Planning</td>
<td>73% (8 of 11)</td>
<td>22% (2 of 9)</td>
<td>50% (10 of 20)</td>
</tr>
</tbody>
</table>

According to Table 4.2, slightly more (79%) of the rural group, than the urban group (64%), and 71% of the total sample, related ideas, concepts, stories, practices, processes or ceremonies which depicted various forms of process thinking that contained content and state merit. In terms of local hazard awareness (the risk perception phenomenon), it seems that the diversity or range of type of environmental hazards mentioned by the rural and urban groups
were fairly similar; when asked about what kinds of local hazards the interviewees were aware of, both the rural and urban groups discussed a similar range of hazards. While almost ¾ of those in the rural group (73%) who were said to possess content and state merit in their ways thinking, also reported disaster planning efforts in their household, the same can be said for less than ¼ of the urban group (22%). Moreover, of the 71% of the total sample who reported process thinking containing both content and state merit, only half of those also reported having disaster kits on hand.

While unable to clarify if there was a link between process thinking and hazard awareness, these data may suggest a link between the worldview phenomenon of doing process thinking and disaster planning in this sample, but this does not hold very well for the urban group, nor the entire sample. As in Axis 1 above, this may suggest that planning for disasters may be more linked to where an individual lives, rather than mere awareness of hazards that exist in the local environment. Also, simply knowing about a hazard does not always yield planning.

Explaining the World: Balance and Imbalance

In Axis 3 of the worldview framework, the notion of seeing the world through an indigenous metaphor of balance and imbalance (versus a linear Western concept of cause-and-effect) was explored in terms of how this way of explaining the world may be related to awareness of the rise in number, frequency and magnitude of disasters in recent years, and how this awareness may be linked to disaster planning. In this funneling of concepts, it is assumed that explaining the world through a lens of balance/imbalance, may be linked to awareness and this awareness may be connected to disaster planning efforts. However, due to an inability to
control either the rise in disasters or the course of imbalance which continues to accompany increasing development and modernity may also present a case for ambivalence which may also relate to disaster planning.

These phenomena were addressed in the following manner. Respondents were counted as speaking of a sense of balance or imbalance when they discussed disasters as related to imbalance between human, natural and cosmic forces, or when interviewees spoke of the value of reciprocity between humans and the natural world, as well as if they view the earth as an animate entity which is responding to the environmental imbalances wrought by human abuses, by causing disasters and destruction. Several of the responses that addressed this axis of the worldview framework came from Question 10 in the interview guide, “How do you explain the rise in natural and technological disasters in the last several decades?” Below, several quotes depict the indigenous worldview phenomenon of balance/imbalance as expressed by many of the American Indian research participants.

I totally believe that sometimes when you do things that’s not what nature is supposed to be experiencing, that you’re that messing with the balance of the world, and so things happen like the tornados and tsunamis and wildfire.
-Samantha, 017- 65 year old, Urban Ojibwe Woman

Well I think on one hand the weather patterns are becoming more pronounced. I think that has something to do with the way we treated the environment. It’s sorta throwing something off balance.
-Blizzard Bill, 022- 49 year old Urban Lakota Episcopalian Minister

I have children and another generation coming behind me so I have to fight for them and be a voice for them, and be a voice for the silent nation; these trees, these creeks and the animals that we have here, try to be a good voice for them also, ’cause they want water and they want to live and to continue on their generations too. These trees want to continue on their generations. These animals want to continue on their generations.
-Vincent, 014- 37 year old, Rural Lakota Man: Community Activist

All natural disasters, I guess is just mother nature trying to take back what’s already hers, maybe like from the pollution in the air. It’s her sign of her fighting back.
-Lawrence, 010- 25 year old, Rural Lakota Man
The phenomenon of acknowledging the rise in number, magnitude and frequency of disasters was identified in the interview transcripts by their responses to question ten mentioned above. And again, household disaster planning was addressed by asking interviewees about the contents of their home disaster kit or asking about planning in general.

Table 4.3

Balance/Imbalance, Rise in Disasters, Planning

<table>
<thead>
<tr>
<th>Phenomena Discussed</th>
<th>Rural Group</th>
<th>Urban Group</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the World in terms of Balance/Imbalance</td>
<td>29% (4 of 14)</td>
<td>36% (5 of 14)</td>
<td>32% (9 of 28)</td>
</tr>
<tr>
<td>Acknowledged Rise in Number/Frequency of Disasters</td>
<td>100% (4 of 4)</td>
<td>100% (5 of 5)</td>
<td>100% (9 of 9)</td>
</tr>
<tr>
<td>Disaster Planning</td>
<td>50% (2 of 4)</td>
<td>40% (2 of 5)</td>
<td>56% (5 of 9)</td>
</tr>
</tbody>
</table>

As Table 4.3 shows, and contrary to the researcher’s expectation, only about 1/3 the rural and urban groups, and the sample as a whole reported explaining the world in terms of an indigenous perspective on balance between humanity, nature and the cosmic forces of the universe. While, all (100%) of those who explained the world in terms of balance/imbalance also acknowledged the rise in number, frequency and magnitude, only half of the rural group, 40% of the urban group, and 56% of this part of the sample as a whole, reported doing appropriate disaster planning efforts. However, as with the first two axes, if there is a relationship between the phenomena in Table 4.3, more rural respondents reported disaster planning than did the rural group.

However, there are problems with these interpretations. For instance, the number of respondents in the both groups who explained the world in terms of balance or imbalance are so few (rural \( n = 4 \), urban \( n = 5 \)), that the “funneling” procedure falls apart and therefore seems
unreliable for analyzing the relationships in this axis of the worldview framework. Although most of the sample acknowledged a rise in disasters, few of these respondents who did so also explained the world in terms of balance or imbalance. This may mean that seeing the world through the American Indian worldview of balance/imbalance, acknowledging the rise in frequency and magnitude of disasters and disaster planning may not be related at all.

*Relating to the World: The Collective and Social Networks*

Axis 4 of the worldview framework explores the relationships between having social networks, risk perception (sense of danger) and disaster planning. It would make logical sense due the amount of security and support that social networks can provide that having more extensive family and community social networks, would relate to risk perception or sense of danger in the world. Additionally, it would also follow that this may influence planning for disasters because having a lot of social networks may provide a false sense of preparedness that results in a certain amount of being a “free-rider.”

To address these ideas, family and community social networks were explored through answers given to several interview questions. For example, Question 2 in which interviewees were asked about their “tribal enrollment status, involvement in tribal matters, family structure, and who they were close to and why?” provided clues to personal and community attachments. Also, some information regarding connection of the individual to the collective came from Question 4 which also addressed social networks by examining how participants are linked to each other through the ways in which they communicate risk information. Asking interviewees about communicating hazard information provided insights into how respondents were connected to family, friends, neighbors, as well as their social networks developed in and...
through cyberspace, internet, and other forms of social media. Questions 6, “Who would you rely on if a disaster happened?” also provided examples of links to other social networks, some of which circled around intense stories of participants’ experiences with actual disasters.

For example, when asked if he was closely connected to in the American Indian community, Blizzard Bill, the urban Lakota Episcopalian Minister revealed an affinity towards the collective, and opposition to overvaluing the mythology of individualism. Bill (022) said,

The community? Ya gotta have it. I mean that’s the thing though, these guys have a whole idea of rugged individualism and isolation and you’re on your own type of deal, and forget about everyone else. That’s what this country is sort of geared towards. It’s a myth. Yeah, that totally comes from Western European mind and thought. It’s not Gospel. Gospel is totally community. You know Jesus didn’t run around alone. He had at least 12 guys with him, and maybe more.

Bill supported his feeling towards community and the collective. He reported having interconnections with a variety of social networks across a range of communities, institutions and individuals. For example, he is an Episcopalian Minister who is active in social justice issues in the urban indigenous community, he runs a weekly free soup kitchen, works as a local artist, and serves on numerous boards and committees representing tribal interests and Church interests.

Karla (006), a 22 year old rural Lakota woman, described how hazard information is shared throughout formal and informal social networks on the rural and isolated geography of the reservation; central to information sharing is the independent, non-profit radio station that seems to deliver community relevant information throughout the daily broadcasts. Once hazard information is broadcast Karla relates how it is interpreted and reinterpreted as it circulates through different people and institutions through cell phone calls and social media alerts. Social media is important for maintaining social networks that can share information that influences one's sense of safety and danger in the world. As Karla (006) said, "That’s where all my friends are; everybody’s on Facebook."
The importance of social networks in the sample can also be seen in who respondents said they would rely upon in a disaster. Deborah (015), a 60 year old urban Ojibwe woman, says she would rely on other families she knows in the Indian community in the event of an emergency, and that she is involved in numerous other social networks, both formal and informal, through living and working at an urban American Indian housing complex and through her ties with her home reservation on the northern plains. Deborah said,

I’m involved in the community. We have 212 housing units. I think it represents about 37 different tribes in this housing complex. So we treat the elders very [well]. We feed them and have parties for them here, and then I work with the residents. I get them situated, because they come from the reservation and they don’t know how to do stuff, so I help them do stuff.

If an interviewee seemed broadly and deeply connected to more than 3 different sets of social networks that they felt they could rely upon in an emergency they were counted as having a higher number of social networks. Or the opposite; if a respondent cited their immediate family or just one or two close friends as their only reliable social networks, they were counted as having a low number of social networks. Also, if the respondent described involvement in thick webs of relations in social networks with people who seemed unreliable, then that node in the network was not counted as part of the respondent’s social network system.

Participants’ sense of danger was addressed by Question 14, “Tell me about how your sense of safety or danger in the world? Is the world a safe place, how so?” If a respondent outright stated the world is a dangerous place then they were counted as having a higher sense of danger in the world. For example, the rural Lakota activist Vincent (014), reported a high sense of risk and danger associated with the potential for water contamination from the proposed XL tar sands pipeline that is intended to cross the northern plains states on its way from Canada to Texas.
There’s already 1 billion people who don’t have access to safe drinking water. They’re drinking poisoned water right now, all over the world. And three or four billion that don’t even have proper sanitation in place. I just see the XL pipeline as the most dangerous thing coming towards my people ever since Columbus landed is probably that pipeline. It’s the most dangerous thing coming towards us and we need to stand up and stop this pipeline because it’s gonna affect all the people of the United States.

However, while many respondents reported a high sense of danger, many others distinguished between danger on the rural reservation and that found in the urban area. Some felt the environment was safer on the rural reservation.

I think the world is kind of safe and dangerous to live in, ‘cause we’re tucked on this Rez and, you know, we’re kinda sheltered from a lot of the stuff around.

-Deidra, 002- 61 year old rural Lakota woman

Other said it is safer to live in the city.

Now that I’m here and I’ve been living here like forever, I think I’m a little more comfortable here than I would be outside [the urban Indian housing complex]. I feel safer here.

-Rita, 016- 39 year old urban Ojibwe woman

A respondent was considered having a “mixed” sense of danger if they said the world is a safe place overall, but they also provide examples of situations that were not considered safe, or if a respondent distinguished between safety and danger as being related to existing in the rural or urban context. However, none of the interviewees were designated as having a low sense of danger. All participants talked about several environmental hazards or dangers in their local environment. As with the worldview frameworks discussed above, disaster planning was addressed by asking participants about the type of disaster plan they had in place in their household (Question 5 on the interview guide). Table 4.4 presents frequency of responses regarding the phenomena in Axis 4.
Table 4.4

**Social Networks, Risk Perception, Planning**

<table>
<thead>
<tr>
<th>Phenomena Discussed</th>
<th>Rural Group</th>
<th>Urban Group</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Number of Social Networks</td>
<td>86% (12 of 14)</td>
<td>86% (12 of 14)</td>
<td>86% (24 of 28)</td>
</tr>
<tr>
<td>High Social Networks &amp; Mixed/High Sense of Danger</td>
<td>100% (12 of 12)</td>
<td>92% (11 of 12)*</td>
<td>96% (23 of 24)</td>
</tr>
<tr>
<td>High Networks &amp; Mixed/High Sense of Danger &amp; Planning</td>
<td>84% (10 of 12)</td>
<td>27% (3 of 11)</td>
<td>56% (13 of 23)</td>
</tr>
</tbody>
</table>

*One respondent in the urban group who reported having numerous social networks said nothing that could be construed as her sense of danger or perception of risk in the world in a general way.

Not surprisingly, as noted in the table above, 86% of both groups and the entire sample reported having a high number of social networks across a wide array of contexts; immediate family, extended family, friends, professional/non-professional contacts, first responder groups, tribal, local, regional, state and federal hazard mitigation groups, work groups, Church groups, social activism groups, community support groups, cultural and belief practices groups, Indian Centers, etc. Within these networks, individuals are often integrated into webs of social relations and social interactions (Borgatti, Mehra, Brass, & Labianca, 2009) through which mutuality, bonds and social support can emerge to support individuals and families during periods of crisis or uncertainty.

Of the 86% of the sample who reported having a high number of social networks, 100% of the rural group, 92% of the urban group, and 96% of the sample as a whole, also reported having a mixed or high sense of danger regarding risky environmental hazards. In terms of disaster planning, of those reported having a high number of social networks and a high or mixed sense of danger about the world, only a large part of the rural group (84%) also reported having an appropriate disaster kit in the household. Only about one-fourth (27%) of the urban group
and a little over half (56%) of the sample as a whole, reported making an appropriate disaster kit. As with axes one and two above, if the worldview and risk perception phenomena in Table 4.4 are related to disaster planning, this seems mostly connected to the rural part of the sample.

Rather than linking social networks, one’s general perception of danger or risk about the safety of the world, as influencing disaster planning, this part of the model seems, again, to point to location (rural or urban) as more associated with disaster planning, at least within the construct of the worldview framework applied and addressed herein. While there were plenty of examples of having a high number of social networks, examples of interviewees expressing moderate and high amount of environmental danger, caution should still be taken when making inferences from such a low number of cases in some of the cells in the tables.

Way of Being in the World: Holism and Interpretation of Danger

Axis 5 of the worldview framework involves an indigenous holistic way of being in the world (as compared to the Western idea of compartmentalization discussed in the literature review chapter). The other two phenomena (risk perception and disaster planning) may be linked to having a sense of holism in that a holistic perspective may be related risk perception (sense of danger) and planning in a way similar to Axis 4 above.

Most of the responses that depict a holistic way of being came from Question 11 on the interview guide, “Tell me about how you see the world in a broad way; what’s your worldview?” However, responses concerning holism and interpretation of danger also emerged in various other parts of some of the interviews. A holistic way of being in the world was conceptualized by reviewing transcripts for passages that refer to the interconnectedness among the human, natural and cosmic domains of existence. These themes include human relationships with the
Earth and with other entities, and as having a sense of reciprocity that guides those social relations. Holism was also depicted in ceremonies that embody in which the interconnectedness of all things is played out in the belief practices, mentioned by some of the interviewees. Holism also dovetails off of the concept of balance discussed in worldview axis number three above. To be sure, holism blends somewhat with explaining the world in terms of balance. Balance not only serves as an epistemological explanation of the world in an indigenous worldview, but also serves as a mechanism by which holism is achieved.

Examples of a holistic way of being in the world are evident in both the rural and urban groups in the sample. Several participants described holism in terms of balance and reciprocity between humans and the natural world.

Growing up I was always taught to respect, and everything that we do offer something, and, in our, in my culture, the way that my grandmother raised us was have respect because she’s taking care of you, and my grandmother put it in us to always respect and take care of Mother Earth because she takes care of us. We live on her and I was taught to take care of her, she is gonna take care of you. And I was always taught to pray to her, besides Tunkanshila; we call [her] Unci Maka, grandmother earth. Growing up I was always taught to respect, and to offer something in my culture.

-Arlene, 002- 52 year old rural Lakota woman: EMT/1st Responder

When we’re taking from the earth, we’re supposed to give offering. And that’s our way of showing appreciation to the earth and what it gives us. Ee try to give back to the earth in whatever way we can. We try to protect it.

-Celia, 027- 27 year urban Cheyenne woman in Dallas, Texas

Justine (18), a 50 year old urban Ojibwe woman elaborates on another cultural practice that reflects the holistic relationship between people during times of stress, such as when a friend or family member is having surgery, Justine said, " Something had happened to somebody and we were downtown there and his girlfriend happened to come in. She was non-Indian and he was Indian and she got really upset and went to Jim’s mom, ‘cause his name was Jim, and said, ‘they were all talking about him, and talking shit and this and that’ and we were talking about
things that we had done in the past, like ‘remember that time that dumbass did this or that’, and he’s in surgery.’ And that’s the way we deal with our stress. We talk about him, you know, so his spirit stays there, so he doesn’t try to leave. He wants to listen to what we are saying about him, you know? But that’s what we do it, even at wakes we do that.”

Another urban interviewee described a holistic relationship between humans and nature, and between particular humans and their own internal deep structures that depict holism.

This whole concept of having dominion over the earth, really I find very, very arrogant and disturbing, because I think we are supposed to be in relationship with the earth, we’re supposed to be in relationship with our environment. We are supposed to be respectful and in relationship with other animals. Just because we don’t talk turkey doesn’t make us smarter than turkeys. I think in Jungian terms they talk about the ‘shadow.’ I think you have to be able to see your own shadow you know. I don’t think that I’m separate from all the stuff around me. It’s when you are in bad relation you know, but there are a lot of people who are not in good faith with themselves. And you’ve got people who think they can isolate themselves, out of being in relationship with other people. ... To me it’s like we’re given these containers that we walk around in but we did not create ourselves. It’s like there’s something that flows through us and everything around us and that’s the relationship. It’s spirit, you know. And I don’t think that can be destroyed. So I’m not really, really worried about disasters. I mean, I see walking disasters every day.

-Sherrie, 024- 61 year old urban Blackfoot/Navajo Woman: Activist and Community Volunteer

A sense of danger (or risk perception) and disaster planning was unpacked as in the section above.

Table 4.5

<table>
<thead>
<tr>
<th>Phenomena Discussed</th>
<th>Rural Group</th>
<th>Urban Group</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holds more of a Holistic Worldview as a Way of Being</td>
<td>50 %</td>
<td>79%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>(7 of 14)</td>
<td>(11 of 14)</td>
<td>(18 of 28)</td>
</tr>
<tr>
<td>Holistic Worldview &amp; Mixed/High Sense of Danger</td>
<td>100%</td>
<td>100%</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>(7 of 7)</td>
<td>(11 of 11)</td>
<td>(17 of 18)</td>
</tr>
<tr>
<td>Holistic Worldview &amp; Mixed/High Sense of Danger and Planning</td>
<td>86%</td>
<td>27%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>(6 of 7)</td>
<td>(3 of 11)</td>
<td>(9 of 18)</td>
</tr>
</tbody>
</table>
Table 4.5 depicts how fewer of those (50%) in the rural group reported having a holistic worldview than did the urban group (79%), with only 64% of the sample as a whole reporting they experience life more through a holistic way of being. As in the worldview axis discussion above (which explored the relationships between social networks, risk perception & planning), none of the participants reported having a low sense danger. Nearly all the respondents who reported having a more holistic way of being in the world, also reported having a mixed or high perception of risk (high sense of danger), rural (100%), urban (100%), whole sample (94%). This appears to support that having a holistic worldview may be linked to higher risk perception. Moreover, as the table shows, of those who reported having holistic worldview, along with high risk perceptions about the world, only about a quarter of the urban group (27%) and half of the sample as a whole also reported doing disaster planning in their household. Yet, 86% of the rural group who reported similar holistic worldview positions and high risk perceptions also reported having a disaster kit on hand. Thus, it seems, as with Axes 1 (experiencing time/space through an indigenous lens), 2 (performing process thinking with content and state merit) and 4 (having a high number of social networks) above, Axis 5 (experience being in the world through a sense of holism) may be related to disaster planning, but again, only for the rural group. However, as above, the low number of cases in this part of the analysis brings into question any inferences that can be made from these data. Below are findings from these data that may also be tied to disaster planning in the sample.

Social Vulnerability and Local Hazards

Risk perceptions and disaster planning are surely related to more factors than one’s worldview. Thus, in order to further explore the relationships between worldviews,
interpretations and perceptions of risk and danger, and how perceived risk relates to disaster planning, outside the constraints of the worldview framework, it is important to unpack the social and physical contexts, vulnerabilities and hazards in the environment in which the research participants live. These vulnerabilities and hazards interact with each other and influence how people live and interpret danger, and react to environmental hazards with ample planning. The vulnerabilities and hazards include multiple phenomena that influence these variables; these include socioeconomic status, the local social vulnerabilities and environmental hazards experienced by the sample, how respondents communicate information about such hazard threats, how they said they plan for these hazards, the influence of the research participants’ sense of trust in state, federal and tribal institutions entrusted to deal with disaster planning, and how several research participants navigate danger and risk in terms of living in two worlds simultaneously; many interviewees report having aspects of both a Western worldview, and that of an indigenous perspective as well. Putting these themes together, weaves a story not only about risk perceptions, but also about the exploratory localized context in which the research questions concerning worldviews, risk perceptions and disaster planning can be understood within the research sample. The socioeconomic context and the specific local environmental hazards discussed below provide the social and physical matrix in which worldviews, risk perceptions and planning interact for the sample. How the respondents say they communicate about and plan for environmental dangers provides a small window into their sense of agency and the themes of trust and living-in-2-worlds throw open the window and casts localized worldviews, risk perceptions and disaster planning ideas as part of the larger social world. Combining the themes above, along with the respondents’ reported lack of trust in institutions that manage hazards, and the fact that so many in the sample actually live in both the
Westernized and American Indian worlds, reflects the many pushes and pulls in which perceptions and social action interact.

Some aspects of the worldview framework revealed insights regarding the relationships between indigenous worldviews, perceived risk and social action such as disaster planning for the sample in the study. However, no matter what one’s worldview may be concerning interpretations of environmental risks and disaster planning, worldviews and perceptions are severely trumped by the constraints of poverty and its totalizing impacts on perceptions and limiting disaster planning. When the research participants were asked what types of hazards existed in their local area, many respondents reflected on various forms of socioeconomic vulnerability through which interpretations of, and responses to, environmental dangers are mediated.

The research participants’ perceptions of hazards discussed below include themes such as poverty, blizzards, tornados, wildfires, and contamination of ground water, air and soil from uranium mining, nuclear reactor leaks and leaks from natural gas and oil pipelines. Social vulnerability is a combination of past and current socio-political and economic conditions, hazard exposure and social response (Cutter, 2003). The hazards discussed below illustrate how disaster responses are conditioned by culturally driven perceptions and interpretations of risk, by one’s sense of vulnerability in the context in which perceptions of risk are socially constructed, and by how these factors influence decision making in terms of action, such as disaster planning (Patterson et al., 2010).

Underlying the environmental hazards that many of the research participants deal with daily, are the hazards, dangers and challenges of living in the economic margins. Poverty has a big impact on risk perceptions for hazards. This is important because the poor in the U.S. are
more vulnerable in natural disasters due to where they live, how they construct their dwellings and social class, all of which are depicted in one’s “place and type of residence, building construction, and social exclusion” (Fothergill & Peek, 2004, p. 89).

If people on the margins actually have the time and means to address potential environmental risks, expending resources to do so may only serve to further increases their sense of vulnerability and risk for hazards because it costs economic resources to do disaster planning properly. American Indians, both rural and urban, continue to lag behind the majority population and other minority groups in terms of disproportionately high rates of unemployment and poverty, as well as lower educational achievement, more accidental death, higher suicide rates and generally higher indicators of health and mental health problems (Fisher & Ball, 2003, p. 209). For example, in the rural sample all interviewees mentioned high rates of diabetes and heart disease and how a lack of resources makes everyday life even that much more difficult for American Indians. Vincent (014), a rural Lakota community activist, recreates how interpretations of danger or risk are often secondary to the daily struggle living in marginal circumstances.

Our houses have black mold and I’m a certified mold inspector and I did a lot of work on this black mold, you know, and a few of them are really dangerous. But, our people are so colonized as a people, they don’t see it as a danger. They’re more worried about paying the light bill. They’re still in that stage where we gotta get our lives paid for. We need food. My kids need some clothes, I need gas for my car. Man, I’m broke, and every day, you’re so depressed because you just need to survive.

While the socio-economic, health and political deficits across Indian country have been belabored in other literatures (Grande, 2004), when asked if the American Indians he knows are resilient enough to withstand a major catastrophic disaster, the urban Lakota Minister, “Blizzard Bill” (022), concisely clarified the economic struggles of American Indian peoples. Blizzard Bill said, “Our people are in survival mode every day of their lives. Every day of their lives, they’re
in survival mode. You know, and that’s really sad, when you think about it.” If we went into the rural areas, on the reservations, I think people would survive because that’s the mode they’re in. They’re in this survival mode. They just will.”

Differences in hazard types have implications for risk perception and planning. An all-hazards approach has been taken by some researchers. However, according to some researchers, although an agent-generic approach to hazards and risk is best suited to the emergency phase of a disaster event, an agent-specific approach can provide differential information about planning for environmental risks (Quarantelli, 1991). While trying to avoid a generic, all-hazards approach, it is still important to know the local hazards of a given environment in order to address risk perceptions associated with each hazard. Despite public desire for education about local hazards that threaten tribal lands and tribal governments, seldom are tribal governments able to do so from a top-down perspective, yet surveys indicate the public would welcome such endeavors (Pearce, 2003). In “Who Fears What and Why?” Wildavsky and Dake answer the question by saying, “because they know them to be dangerous” (1990, p. 42). To respond to the mitigation needs of tribal peoples we first need to know which hazards are prevalent, and to what degree they could impact tribal people. Thus, it is necessary to start by knowing what hazards the American Indians in the sample say they fear. Moreover, the hazards the research participants said they “know to be dangerous” are important because it frames respondents’ interpretation of environmental hazards, and may provide clues to how worldviews, risk perceptions, cognition, behavior and decision making, are related to disaster planning (Koltko-Rivera, 2004). Many of the environmental hazards discussed below provide dramatic snapshots and images of vulnerability and resilience, and perceptions of the outcomes (real or imagined) of natural and man-made disasters in the lives of the research participants.
Natural Hazards: Blizzards, Tornados, Wildfires

Blizzards

The weather in the northern plains provides dangers from natural hazards on a seasonal basis, some of which have led to devastating outcomes, especially for respondents who are already saddled with the socioeconomic vulnerability mentioned above. However, the perceived risk for the dangers of blizzards was more prominent for some research participants than others. For instance, while 100% of the rural part of the sample provided rich descriptions of the dangerous experiences involving winter blizzards, only 57% of the urban part of the sample discussed blizzards as highly threatening. To illustrate this differential risk perception associated with blizzards, all of the rural interviewees related hazardous personal experiences with a blizzard that hit the reservation seemingly without warning on November 5th, 2008. The blizzard shut down nearly the entire small reservation town where the rural interviews took place. The storm covered the northern plains with a foot of snow and was accompanied by 50-85 mph winds, causing 10-20 foot snow drifts. Interviewees related that due to poorly planned housing locations, construction methods and infrastructure on the reservation, many families had to abandon their homes during the blizzard because their only source of power was obtained through electrical lines, which had been damaged during the storm. Many who lost electrical power headed for the safety of the local school gymnasium, which had been turned into a make-shift shelter. Thousands others were trapped inside their homes without electrical power for so long that many households reported having to burn their furniture just to stay warm (Schilling, 2008). In many reservation communities there is an 85% unemployment rate and numerous households lack of resources to maintain essential propane supplies. The storm exacerbated existing economic vulnerability of many American Indians in the region; lack of basic food,
shelter and medicines became a problem for many of the rural interviewees. Many rural interviewees reported that conditions were difficult. For instance, the National Guard had to use Blackhawk helicopters to locate stranded motorists throughout the region, and then to eventually airlift basic food, water and medicines to the Indian reservation, which was completely cut-off from the outside world (Martin, 2009). According to several of the rural interviewees, as the blizzard tapered off, a well known non-Indian man with a tractor and snow plow took 7 days to dig an 8-mile road to open up the small reservation town. Below, culled from the rural interviews are several of the most salient quotations that depict vulnerabilities such as resource shortages, poor land-use and building construction patterns, geographic isolation, economic problems, and other threats that were revealed during the blizzard of 2008. These deficits were compounded by the storm and increased the risk for morbidity and mortality for the people in the reservation community. Interestingly, most of the urban part of the sample lacked the immediacy and heightened perception of risk associated with the effects of blizzards on the northern plains.

It just hit us all at once. The snow was up to the roof of the houses here in this community and the surrounding area, and due to lack of employment around here we lack money sometimes to help pay our propane bill, our electric bill, so they shut ‘em off and stuff.” So, a lot of other people didn’t have enough propane and no lighting for their homes. They all went to the school and lived off FEMA and the Red Cross; the Red Cross dropped food off from the helicopters to the school.

-Randy, 003- 43 year old Rural Lakota Man

Nobody was prepared for that at all. This whole housing project up on the hill, the heat is all electricity, no generators or anything. It was all electricity so their heat wasn’t running. Their water wasn’t running and you couldn’t plug anything in because the power, I mean everything was electricity. We were coming back from a foster-grandparents meeting at the casino at about 9 or 10 at night and we only made it as far outside, about 7 miles outside of town we got stuck on the road. My father was sitting and praying and we were all calm, not panicking. My mom got on the driver’s side so we pushed her out. She just stopped the car and let it idle. We had to have it idling all night
long ‘cause it was cold … it was a miracle we survived that night’ because it was really bad.

-Karen, 005- 49 year old Rural Lakota Woman

For some people on the reservation the blizzard of November 2008 was not only catastrophic to community infrastructure and housing, but the hazard also accompanied personal tragedy, some of which depict social and economic vulnerability, as well as the physical dangers associated with hazards such as blizzards on the northern plains. For instance, as Leonard (008), a 25 year old Lakota man tells it, while braving the elements to get to the local school gymnasium (which had been turned into a community shelter) to find his cousin so they could both attend Leonard’s father’s wake, he related that due to the freezing temperatures, the blowing snow and the poor visibility, they had trouble finding their way along a usually well-known road. They could not even navigate their route by following the electric line poles that usually parallel the roadway because almost all of the electrical pole lines on the reservation were broken off from the frigid temperatures, ice, snow and wind. Moreover, having limited reliable transportation on the isolated reservation presents further risks for those experiencing a blizzard. For example, Leonard (008) said,

Nov. 5 2008 my father passed away at about 6 o’clock in the morning and that evening, that’s when the blizzard hit. That’s why it’s so memorable for me; the same day my dad died, that blizzard happened. It was amazing. The snow banks way up there. The telephone posts split in two like a toothpick. If you break a toothpick, how it looks, that’s how the [telephone] posts were all around here. It’s the first time I’d ever seen something that crazy, just to see the town shut down like that the whole time. And there was an ice storm the next morning. We went outside in the morning and we started the car, the serpentine belt broke, and we went down to my grandmas, and the same thing happened to her car, the serpentine belt broke.

-Leonard, 008- 25 year old Rural, Lakota Man: 1st Responder

Leonard (008) stated that he and his cousin traveled the usually 30 minute walk in about 2 hours to his father’s wake, exposing themselves to the harsh blizzard conditions without appropriate clothing and boots. Although both Leonard and his cousin could have missed the
wake and stayed in the relative safety of the gymnasium-turned-shelter, ceremonies such as wakes, births, and other family events are important to Leonard and his extended family on the reservation.

Isolation and lack of reliable automobiles present vulnerability for tribal people on the vastness of the rural reservation. The total amount of reservation land (as well as many other reservations in the northern plains) covers several counties with highly variable and rough terrain in which many Natives live in more isolated and difficult to reach places, especially many of the elders on reservations. While it is obvious that remoteness is perceived as a risk factor for many in the rural sample, isolation can increase risk vulnerability in such rural places, as well as prohibit easy disaster planning due to costs and lack of easy access to planning resources. With few funds for expensive equipment, such as snow plows for all the districts on the reservation, the isolation and blizzard conditions intersect to create dangerous situations. This economic and geographic or spatial vulnerability during the 2008 blizzard amplified the hazardous physical conditions for people coping with food insufficiency. For instance, as rural interviewee Nancy (009) said, “If the Red Cross didn’t bring those boiled eggs and bacon, I’m pretty sure I would’ve starved.”

The heightened perception of risk due to isolation of many households on the reservation is also evident in Leonard’s (008) depiction of the events on the day of the blizzard.

On the day the blizzard hit, my auntie, who lived in a secluded area too, her husband (Leonard’s uncle) got killed in the house. The cops and the ambulance could not get in there because of how secluded it was. The roads needed to be scraped and they needed to get in there to dig him out. But they couldn’t reach him so she sat with his body in that house for 3 or 4 days until they came and got his body. Like I said, November 5th 2008 is a day that will always stick out, because my auntie lost her husband and I lost my dad that day.

-Leonard, 008- 25 year old, Rural Lakota Man: 1st Responder
Although hazards like blizzards present many dangers, as mentioned above, more of the rural part of the sample (79%) reported having sufficient disaster planning kits in their household than did the urban group (29%). Disaster planning for the rural group is best exemplified in the key informant’s (Kevin) household. Between Kevin (012), a 48 year old Lakota EMT and his wife Arlene (002), the two had almost 40 years of experience working as EMTs on the reservation ambulance service and rescue squad. This long term experience with emergency situations seems to have had a positive impact on disaster planning for this particular household. While a firefighter and Incident Commander on the reservation Fire Department (William, 013) stated that most reservation households are ill equipped for disasters like the blizzard of 2008, Kevin’s (012) family was well prepared. They had a good supply of propane for cooking and a heat source, and the family had plenty of food and disaster kit materials to ride out the storm, as well as enough resources to take care of many other people. As first responders, their home has long been a great resource and source of resilience for the local community. For instance, Kevin (012) said “sometimes our home is like an after-hours clinic. We take care of them. We take care of all of the locals, our tribal members here.” Karla, 22 year old daughter of Kevin (012) and Arlene (002), also reported that during the blizzard they were fairly well prepared. Karla (006) said they had a house-full of friends and extended family members staying at their home during the blizzard. During the blizzard, Kevin, Arlene and fire incident commander William, reported they spent much of the blizzard period searching out the most vulnerable people who had not been heard from in a while, checking on elders and other community members who were shut-in and isolated during the storm. Kevin and Arlene spent other time delivering supplies, when resources could be found, to isolated people they could reach. Their actions reveal a sense of
mission and agency in terms of coping with the deprivations and challenges of a large scale
disaster.

I’d leave at 8 o’clock in the morning from home and not return until 8 or 9 that night, so 12 hours at a time. And we stayed on the trucks that could go around and cut little roads here and there. We just checked on everybody that we knew stayed home. We made sure that if they didn’t have a place to go, we sent ‘em to the school, because sometimes they had no source of heat or nothing. So we made sure that had a place to go.

-Arlene, 002- 52 year old Rural Lakota Woman: EMT

We delivered everything, wood, food, water, whatever they needed, blankets, clothing. We opened up roads. We got to the people that the cops said they couldn’t get to. If it meant walking in or whatever, that’s what our job was to be. The snow was probably around four feet at the time in most of the areas.

-William, 013- 29 year old Rural Lakota Man: Fire Incident Commander

While the blizzard of 2008 had a big impact on many families on the reservation, as stated above, the risk, danger and urgency of such winter threats was not as apparent for some of the urban Indians interviewed. Though blizzards are taken serious by some of the urban Indians, especially those who return to their home reservations regularly, for some, especially those completely disconnected from reservation life, the risks associated with winter blizzards are perceived to be minimal. For most of the urban interviewees, spatial isolation was not a problem. Some interviewees living in the city seemed to be relatively unconcerned with being left without power or contact with emergency support services. For instance, Samantha (017), a 65 year old urban Ojibway woman said, “I love blizzards. I don’t care, snow me in for a week. I don’t have to go to work and I get paid for it.”

While lacking much of the dread and fear of large scale blizzards were described residing in a major metropolitan area does not necessarily increase risk and vulnerability to hazards (Cross, 2001). Moreover, while lack of concern or fear in the urban sample regarding blizzards may not actually raise vulnerability or inhibit “capacity to cope with, resist and recover from the impact of a natural hazard,” lack of awareness may impact disaster planning in that it may limit a
person’s capacity to anticipate the magnitude of such events (Hewitt, 1998). Thus, having low concern or minimal awareness of the actual dangers of a winter blizzard may contribute to poor disaster planning for the urban part of the sample.

However, the lower perception of risk associated with blizzards in the urban part of the sample may be an artifact of living in the city. In urban areas, there are more resources to manage hazards and disasters (Cross, 2001). With the high density of emergency services, and the expectation of rapid assistance, some people just do not consider themselves as vulnerable to some hazards in urban, metropolitan areas. Sometimes risk and danger levels are unexamined, left to axiomatic, taken-for-granted, veiled aspects of living in the city. Responding to a vignette presented during the interview in which a huge blizzard knocked out the electricity, some urban interviewees showed how difficult it is to think of the complexity involved in a major urban disaster, especially if a person lacks prior experience with intense blizzard conditions. For example, Samantha (017) responded to the vignette by saying, “If the electricity went out I’d have to start knocking on doors and see who is around in the building. There are 14 apartments in our building and I’m sure, between us, we can figure something out. And the cell phones will probably be working anyway, if they’re charged up.” Although Samantha may have experienced blizzard conditions in the urban area in which she lives, her comments may reveal she has not personalized the fear and devastation of the 2008 blizzard that sensitized most of the rural part of the sample who experienced the disaster directly.

Tornados

One of the main hazards faced by everybody living on the northern plains is the seasonal tornados that rip through the region with seemingly increasing intensity and frequency. Nearly
equal numbers of rural (64%) and urban (71%) interviewees either directly or indirectly discussed fear and danger associated with a tornado experience,

Me and my grandma were at my auntie’s and you could see outside—a tornado. If you looked out the window, you could see the funnel forming. It started hailing, like it started big, old balls of hail started and one of them broke my grandma’s windshield, and cracked my auntie’s windshield.

-Gina, 007- 18 year old Rural Lakota Woman

It was real scary, unimaginable. Scary as you could think. I mean natural tornadoes are scary. Big winds are scary and so is hail. They found them outside as big as softballs. It was amazing.

-Vincent, 014- 28 year old Rural Lakota Man: Activist

The most illustrative example of the dangerous and dislocating aspects of tornados was noted in the words of Arlene (002), a longtime reservation EMT and rescue squad worker who learned the fear and danger the storms can bring. Arlene was called in to do triage after a tornado hit a small town on an adjacent reservation in the summer of 1999. The storm pelted the area with grapefruit sized hail and damaged or destroyed over 250 homes with F2 level winds, leaving many Native households homeless. Fortunately the tornado resulted in only one fatality; the person was later found to be related to the family of “Blizzard Bill” (022), one of the urban research participants. When responding to the tornado, Arlene’s (002) sense of uncertainty, disorientation and dread was quite apparent in her words. Her words eerily depict the shock she experienced at first sight of the surreal devastation she saw as she surfaced from the controlled and ordered space of the ambulance.

I stood there for a long time, baffled. The church is laying way up on the hill. They had a little metal building that was twisted and laying off somewhere else. All the houses were either leaning sideways or off their foundations. I saw a vehicle with a truck balancing on top of it. It looked like somebody just came and jerked out your plants from your garden. That was something to see.

-Arlene, 002- 52 year old Rural Lakota woman: EMT/ 1st Responder
Tornados happen often on the northern plains. The shaken, confused and disoriented, state of mind reported by Arlene as she entered the damage-zone in the adjacent reservation tornado of 1999, serves as a significant reminder of the dangers of these storms. Shocked at the cognitive dislocation of structures she had known to be stable symbols of reservation life, her whole life, and bewildered by the destruction, Arlene let the story tell of its own disorganization by providing a vivid description of the disaster scene. However, she also worries about long-term impacts on those who wander into such devastation. Arlene (002) described the once familiar tornado scene by referring to only one standing symbol of order remaining from before the storm, “The only thing recognizable was the store.”

In the urban group, a vivid tornado experience was discussed by Justine, a 50 year-old Ojibwe woman. Justine related a colorful childhood tornado experience that has left an indelible picture in her mind that she said still spooks her. While fleeing a tornado that blew out all the glass windows in her apartment building, Justine retains a crystal clear memory of children running shoeless, screaming, leaving little blood red footprints on thousands of broken shards of glass. To this day, personalization of this hazard experience (Lindell & Perry, 2004) has left her with an obsession to keep her shoes close to her bed at night (and her children’s shoes by their beds), just in case she has to evacuate like when she was only 6 years old. Justine (018) said, “If something happens the one thing you need is shoes on them kids’ feet.” Though some studies support that personalization of a hazard experience provides an important link between experience and planning for disasters (White, 2007), Justine is among those in the urban group who do not have a disaster kit in their household. However, she and her family are ready to evacuate the family home on quick notice, as their shoes are always on the ready.
Another frequent summer hazard in the northern plains is wildfire. While only 2 of the 14 urban interviewees mentioned wildfire as an environmental threat, 100% of the rural research participants talked about the risk and dangers from wildfires. The high percentage of rural interviewees who discussed wildfires is not surprising given recent circumstances on the reservation in September of 2012. Wildfire was scorched in the minds of the rural interviewees; just 3 weeks prior to the field work there was a wildfire that quickly burned a wide swath across the reservation, burning an area the size of the city of Chicago, the perimeter of which took 3 hours to drive with my main contact person on the reservation, Kevin. However, this was not completely unexpected throughout the region. During the last 7 years of drought in the rural community, the perceptions of vulnerability to and risk for natural and/or man-made wildfire has been very high for many who feel the whole reservation area is tinder-ready; just a spark could start a wildfire that would quickly spin out of control and cause fear and dread for some.

It’s like if you light a match, that’s how wildfire is. It could easily get this way with a shift of the wind. It may seem far, but to a fire it’s nothing.

-Karla, 006- 22 year old rural Lakota Woman

I could sit there and watch a controlled fire all night, but once it gets out of hand I freak out.

-Gina, 007- 18 year old rural Lakota Woman

While parts of the reservation burned, some in the urban sample reported they followed the wildfire’s progress because they had strong family relationships back on the same reservation. The vulnerability of rural residents to wildfire parallels a vulnerability involved in blizzard conditions discussed above, isolation. Isolation and lack of [firefighting] resources make some small communities on the reservation more vulnerable to wildfire. The small reservation town where the rural interviews took place lies about 80 miles from the centralized
town where most tribal support services are located. As Randy (003) repeatedly complained during an interview, most of the rural group live in an outlying town that is often one of the last communities to get assistance from the tribal council in any disaster. This raises Randy’s sense of vulnerability and perception of risk for wildfire and presents barriers to disaster planning; without resources it is difficult to stop a wildfire. Referring to a smaller wildfire that happened a few years prior, Randy (003) related the outcome of this kind of vulnerability, saying, “This community alone got like 7 houses burned down, and I believe maybe 5 of the 7 could be saved if we had a fire truck or something locally, but there was none around so they burnt up.” Leonard (008) supported Randy’s concerns about isolation and lack of resources to deal with wildfires, saying, “Out here on the Rez it could take up to 90 minutes for a fire truck to get here. By then a row of houses could burn up.”

Some of the rural interviewees, whose work and volunteer roles put them in frequent and close proximity to hazards, reported little dread and fear of wildfire. The rural firefighters, and EMT’s/first responders sometimes framed interpretations of danger, less in terms of fear and more in terms of human agency and response at institutional levels of public safety (firefighting and 1st responders). When asked if they were afraid during the recent wildfires, William and Kevin, who are both experienced fire fighters, stated,

Afraid isn’t the word anymore. There’s a lot of adrenaline, you know, excitement, from trying to get resources to the right spots. In the first hour of big fire like this it’s usually pretty chaotic; there’s lots of variables that go along with it but we love what we do and you get the gratification of it when you get it knocked down.

-William, 013- 29 year old Rural Lakota Man: Fire Incident Commander

Oh, I’m not really afraid. You got other tribal members that come up here and stay. They got Indians from the neighboring reservation and another four Indians from 2 other reservations, and they’re just stationed here. So if something starts, you’re already out there. Plus the local counties, they come out to fight any kind of fire disaster to help each other. And they get it contained pretty good.

-Kevin, 012- 48 year-old rural Oglala Man: EMT/1st Responder
William (013), the rural, American Indian firefighter and Incident Commander, says the tribe has a pretty good handle on wildfires and that they use Native prescribed fire techniques to prevent large fires, a technique not always in line with non-Indian ways of doing things. William said,

We go around all the communities, to all the housing and we burn some areas so the grass is shorter on there, plus it brings back the natural grass we want there. We generally kick out all the invading species and fire helps that. It helps with the soil. It gets nitrogen back into the ground. After you burn something, the grass comes in better. Off the reservation, it’s different. People don’t want you to put fire on the ground to stop fire. There’s a certain technique, you know there’s certain tactics that you can use out there, but they don’t want you to do it because you’re gonna burn up too much ground. But in the long run, it’s gonna save more ground if you think about it.

Although some urban interviewees mention wildfire as a common hazard to the northern plains states, they mostly talked about wildfires in the context of their home reservations; overall there seemed to be a lower perception of risk for wildfires in the urban sample. According to a few of the urban interviewees, the reasons for the lower perceptions of risk associated with wildfire in metropolitan areas are two-fold. Wildfires tend to take place more in the northern forests of the plains states, and when fires occur in the urban area there are more fire suppression services available to address the hazard. As urban interviewee Rita (016) stated, “In the city they tend to contain it faster.”

Man-Made Hazards: Oil Pipelines, Uranium Mining, Arsenic and Reactors

For several interviewees in the urban part of the sample, the dangers of arsenic-laced soil and nuclear power generation stations near the metropolitan area were reported as significant environmental concerns. Many reported awareness of arsenic contamination of the soil, decades old contamination stemming from an open-lot pesticide plant that blew the substance throughout the urban area. Other urban respondents discussed the Prairie Island nuclear reactor, which sit
30 miles south of the city on an island in the Mississippi River, adjacent to the Mdewakanton Indian Reservation and the Treasure Island Resort & Casino. Perceived risk associated with the reactor is not without merit. Urban respondent; Pamela (020), reported that the reactor has leaked tritium in the past, a radioactive form of hydrogen that has leaked from about 75% of all nuclear reactor sites in the U.S. (Donn, 2011).

The rural group also reported dangers associated with environmental contamination. The environmental hazards reported by several of the rural interviewees include previous water contamination from uranium mining and current attempts by Multinational Corporations (MNC’s) to run oil pipelines through the rural reservation lands, thereby threatening a key source of water in the northern plains, the great Oglala aquifer. While many rural interviewees spoke about the environmental threats from the efforts of the Keystone XL pipeline corporation to pipe tar sands oil across reservation land and on to Texas, few spoke of the older but less well known radioactivity that plagues the area. Only 2 of the 14 rural interviewees discussed the risks associated with radiation from past uranium mining in the region, or even mentioned it, even though just recently lobbying for efforts to mine yellow cake uranium down-wind of the reservation have been renewed. Whether future uranium mining will impact the tribe is unclear, however radio-active contamination remains a clear and present danger on the reservation. Rural American Indian activist, Vincent (014) reported that there are thousands of abandoned test holes and open-pit uranium mines in the western Dakotas that continue to contaminate the soil, water and air with radioactivity, a deadly hazard that will remain for hundreds of thousands of years.

Others in the rural part of the sample spoke of the danger of water contamination by Keystone XL oil pipeline efforts to illegally cut through sovereign reservation land with supply trucks and efforts to trench a pipeline through the reservation as well. In the quote below, the
perception of risk for contamination from uranium and oil pipelines were interpreted as severe. Appealing to health and ethical concerns about the environment, some interviewees looked to the future to exhort and predict what the hazardscape (Khan et al., 2012) may hold, should water contamination occur. For instance, Vincent (014), said that an oil pipeline break over the Oglala water aquifer would completely contaminate the water supply for the entire middle part of the county, and as seen recently in several tar-sands-oil-pipeline breaks, they are nearly impossible to clean up (Lydersen, 2011).

Vincent’s experiences opposing construction of the oil pipeline through his reservation have changed his perceptions of risk associated with the oil industry and the threats it poses to his people. His passion for the safety and well-being of Indians and non-Indian alike was evident during the interview process. His passion comes together in his activism and perceptions of environmental risks as they threaten the environment. For example, Vincent (014) warns that the tar sands oil pipeline will certainly fail, and then contaminate the Oglala aquifer, the only water available, other than the questionable drinking water piped in from a river over three counties distant, which several rural interviewees reportedly fear is contaminated as well. Vincent interprets the danger from the XL pipeline as fatal, likely to destroy his tribe, not to mention the potential morbidity he attributes to tars sands oil development efforts.

The oil pipeline is just a disaster waiting to happen. It’s not a matter of if the pipeline will break, it’s when it will break. It’s probably going to be the end of my people. We already have contamination from uranium. We already have babies being born with their hearts on the wrong side of their bodies. My niece was born with her insides out, and there’s a little girl I know who just got a transplant luckily, because she was born totally messed up. So if you love your water, if you love your life, then you have to be on board with that. If you like to get up in the morning and drink water then you better be against the pipeline. What are you gonna do when there’s no more water to drink. I got children and what are they and my grandchildren gonna do when there’s no more water?

-Vincent, 014- 28 year old Rural Lakota Man: Community Activist
Vincent’s (014) perception of risk from uranium mining is reflected in chilling anecdotal evidence attributing continuing poor health of many on the reservation to environmental contamination from radiation. It is well-known that the U.S. government has a long history of doing uranium mining in the region (Shriver & Webb, 2009). Vincent (014) said he felt he has confirmed this. He reported that in his 5 years working as a federal monitor, he found the uranium levels in many reservation water wells contained up to 30 times the maximum allowable concentrations. Frighteningly, U.S. Forest Service testing of soil and waters has revealed radiation levels 120,000 times higher than the normal background radiation expected in the area. Many of these hazardous areas lack even the simplest of warning signs to keep the public away from them (Gerritsen, 2009). This poses short and long term health risks for Vincent and everybody on the reservation.

Vincent’s (014) story of uranium contamination in the ground water on the reservation was substantiated by one of the urban Indian interviewees as well. Pamela (020), a 69 year-old Lakota woman, long-time Indian activist and one of several co-founders of the American Indian Movement (AIM), is trained as a paralegal, as well as in microbiology. She researched water quality in the aquifers of the northern plains states. Pamela said her findings not only support US Forest Service claims of heavily irradiated water, but also supports Vincent’s anecdotal evidence by citing the presence of animal mutations, ostensibly caused by irradiated water. Pamela’s research increased her risk perception of contaminated water. Pamela (020) said, “If you contaminate the water, that’s it, and we’re seeing evidence of it. We found 2-headed frogs in all the aquifer studies in the entire state.”

Both Vincent and Pamela warn of the continued corporate efforts to take advantage of the marginalized Plains Indian tribes. Both report working to fend off further uranium mining on or
near reservation lands. While the tribal council has been able to keep further uranium mining off the reservation, Vincent said the threat and perceptions of risk still loom heavily in his mind. Outside commercial interests are still trying to sway the Council to allow them in, if only to do some “test drilling.” To that end, even though the tribal Council currently has a strong resolve to prevent such efforts, Vincent relates how representatives of MNC’s continue to try to bribe the Council with monetary gifts to get them to open up the reservation to uranium mining. His words show how persistent the corporations can be. Vincent (014) said, “So far our Council has been fighting them off, telling them they can’t drill on our land. But more and more millionaires are visiting our Presidents and Council people and slowly getting them to change. One millionaire just recently came in and gave them all $500 each. Some of our Council gave it back but some of them didn’t.”

Although only 9 out of 14 (64%) of the rural interviewees warned of the high risk associated with tar sands mining, some cited anecdotal examples of risk to health taken from Canadian First Nations peoples’ stories and experiences with the environmental hazard, many of the urban interviewees were more fearful of nuclear power plants.

Just listening to the ladies talk about what it did to these ladies who lived right up there [in Canada] in it, and what it [tar sands oil extraction and pumping] did to their community, to their people and to their little children; some were born deformed. They blamed the pipeline because of their water. Hearing all that, I don’t want the pipelines here. You know, my grandkids are growing up, and what’s gonna be for them? It might create jobs and stuff, but that’s a short time. What about the lifetime that the rest of us have to live here. What’s it going to do to our water and our environment?

- Kevin, 012-48 year-old rural Lakota Man: EMT/1st Responder

In the urban part of the sample, 71% of the interviewees mentioned their fear of radiation from the three nuclear reactors that surround the metropolitan area, one of which, the Prairie Island reactor, was mentioned most frequently. As stated above, the Prairie Island nuclear reactor shares an island in the Mississippi River with an Indian reservation and a popular Indian
Casino, presenting the potential for a low risk/high impact catastrophic intersection of hazard and social factors. Two urban research participants mentioned how they balance their fear and perceived risk of the reactor, against their attraction to the casino. They seem to cope with the dissonance from being drawn to the Casino for recreation, and the push of the danger from the reactor for people to stay away. Another urban interviewee mentioned the potential secondary risk that evacuation from a large city after a nuclear accident could cause.

I’m fearful because it [the Prairie Island nuclear reactor] is one of the bigger disasters; I used to never go to that casino. I’d only go in the dark, and it’s funny because you know it’s still there but you just can’t see it.

-Rita, 016- 39 year old urban Lakota Woman

I think evacuation is one of those things; it’s the individual, you’re on your own. And as I’m just sitting here thinking about it, what would happen if a nuclear meltdown occurred? Most of the Indian people I know and those in my Parrish don’t have vehicles, or if they do they’re not in the greatest shape.

-Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopalian Priest

An environmental hazard mentioned by over 40% of the urban part of the sample involves arsenic toxicity of the soil. The presence of arsenic contaminated soil in the urban area is supported in scientific studies undertaken by various agencies over the years. Arsenic laden soil has been detected in several areas around the city, but not in a predictable and even pattern, an outcome that raised suspicion for some of the interviewees, and only serves to raise their perceptions of risk with the hazard. In 1994 state agencies found fatal levels of arsenic contamination in a part of the city where many American Indians currently reside; the contamination came from a pesticide plant which stored the substance in large uncovered piles, and was thus subject to spreading by prevailing winds. Arsenic is a considerable threat to health and well-being. In acute arsenic poisoning humans can experience everything from gastrointestinal discomfort, vomiting, diarrhea, blood in the urine, anuria, shock, seizures, and coma, to death. Chronic exposure can cause skin lesions, peripheral vascular disorders known as
“Blackfoot” disease, liver swelling and cirrhosis, bone marrow depression, renal problems and diabetes (Hughes, 2002). Below, some of the urban interviewees describe the risk associated with arsenic toxicity in the soil and how they mitigate the risk, as well as their distrust of the authorities who have tried to explain the check-boarding effect the toxin has had as it wafted throughout the city.

Different sites around my apartment complex have tested positive for arsenic. They came in and scraped off the top layer of it and said, “ok, now it’s environmentally safe.” I said, “ok, if it was across the street and it was down the block and behind me, why isn’t it in my spot?” You know, why can’t it be here?

-Lori, 025- 44 year old urban Omaha/Lakota Woman

The EPA came in and did soil testing on everybody’s lawns. But it seemed kind of hit and miss. On my block I think they dug 2 feet of soil out of 3 different yards that were kind of far apart. So I was wondering like, “ok, how come these houses on either side of one where they dug up, why didn’t it have a high arsenic level?”

-Sherrie, 024- 61 year old urban Blackfoot/Navajo Woman: Activist and Community Volunteer

One urban interviewee cited arsenic-laced soil as being high risk to the health of elders. She said that many of her elders (from a rural reservation in northern plains) come to the urban area when they are older and begin local farming projects, but Justine said then they often suddenly developed breathing problems and cancer, and then soon die. Justine (018) said, “They’re great farmers. They love the land. But they need to raise their beds, to not plant directly into the ground where there’s arsenic.”

Other vulnerabilities mentioned by the rural group included poor land-use and construction processes, as well as lack of knowledge about some types of hazards. For example, when constructing much of the housing on the reservation the BIA construction protocols and processes built small houses with 2 or 3 bedrooms, ignoring traditionally accepted building and housing patterns. Placing houses in non-traditional places and using poor construction methods, tools and supplies serves to raise vulnerability of the community to hazards. These land use
patterns and shoddy building construction continue to exacerbate hazards. The BIA built supposedly appropriate houses on the reservation, but did not build houses to benefit extended families, nor did they landscape yards in safe ways. Water and waste lines often break during the deep freeze of winter months. There are poor drainage systems, with exposed pipes buried so shallow that they are crushed by cars parking in the driveways. Poor drainage in cluster housing neighborhoods, which has turned front yards into seasonal swimming ponds after strong rains and made excellent habitat for disease-bearing mosquitoes (010), combined with inappropriate electrical and heating equipment, create high risk contexts in which people tend to flee in a disaster. Moreover, these “hurricane houses” built in the middle of the country have proven to barely tolerate common wind storms of mild to moderate intensity. For instance, Nancy (009) said, “they told my uncle that those were hurricane houses, but when a big wind hit you can actually feel that house moving. I thought it was gonna fall apart, because you can feel it moving, rocking back and forth.”

In the urban interviews, there was a generally less knowledge or concern regarding some environmental threats. As urban interviewee and community activist Pamela (020) said, “Right now I would say that the atmosphere about the people is that they’re not worried about any kind of disaster, at this point. It’s just not, we’re in Minnesota and this stuff hasn’t happened very often, except for tornados.”

The most salient urban hazard mentioned was about the Prairie Island nuclear reactor and its proximity to reservation land and a popular casino. Pamela (020) reveals her lack of trust in the ability of institutions to manage nuclear power plants or wastes, or for the city to even come up with feasible evacuation plans. When asked if she worried about having a radiation leak at the Prairie Island nuclear reactor plant Pamela (020) said,
It’s happened” [referring to Prairie Island Nuclear reactor venting of Tritium]. I got a phone call from the military saying that the alarms were going off at the plant and people were driving by really fast, getting the heck out of there. And they hadn’t told ‘em anything about it. The Prairie Island group, they hadn’t told ‘em what to do. So I said, “get in your cars and get out of there, come up to the clinics.” So I called the State immediately and talked to the State Health and I said, “do you know there’s an emergency at Prairie Island?” and they said “no.” They hadn’t heard about it.”

Communicating About Hazards and Disasters

In the huge diversity among and between American Indian tribes, communication is consistently cited as a significant obstacle to risk management. For example, communication of risk and hazards information is difficult in rural Navajo households, where 60% lack telephone services, cell phone service is spotty, and 30% lack electricity with which they could access hazard news on the TV or radio. These communication delays can lead to increased risk perception, morbidity and loss of life (OECD, 2006).

The interviewees reported there were several ways in which they communicate risk information about hazards and disasters. Communication methods mentioned by the interviewees are discussed below. These included the use of television and radio, word-of-mouth in face-to-face conversations and cell phone calls, various forms of social media, as well as through police announcements via loud speakers or public address systems and through community warning sirens. The one factor that stands out in the communications examples below is that hardly anyone in either the urban or rural groups relied on only one source of information regarding risk information about environmental hazards. When asked how they communicate hazard information the respondents provided varied responses.

With my diabetes I can’t see very far. I can’t see that good so I hardly watch TV and I don’t listen to radio either. I just rely on my grandkids or my neighbors. We warn each
other of things, or what’s gonna happen, yeah because they will run over there and let me know ... I believe it if somebody says it.

-Diedra, 001- 61 year old rural Lakota Woman

When I hear about something, first I’d try to talk to my mom and dad (002 & 012) to see what they’re gonna do, but I have an adopted sister that lives in a town 35 miles away and everything, so if she calls me to tell me that something’s really wrong I believe her and take it seriously and do what I need to do to make sure me and my kids and my mom and dad and my brothers are safe.

-Lisa, 004- 28 year old rural Lakota Woman

Rural interviewee Leonard (008) said he gets most information about hazards from the news, oftentimes through social interaction with his grandma, who has a hearing impairment. In order to help his grandma stay up on current events Leonard watches the news then tells her everything that has been said. Leonard (008) said, "My grandma wants to know what’s going on in the news, right? So one of us will sit there and watch the news for her because she’s hard of hearing. So one of us will listen and tell her about it and she’ll tell us about what’s going on. Like recently there was a fire out here, outside of town that was supposed to be a controlled burn, but it didn’t. They let it go." However, the rural isolation of the reservation is a factor in obtaining accurate weather forecasts or hazard warnings. Distant TV stations are not much help with the frequently unpredictable weather of the northern plains, so they often fail to accurately report threatening weather; these stations are over 100 miles away. Thus, most of the rural respondents reported they often rely on the local reservation radio station for accurate information, which is then transmitted throughout social networks via cell phones and other forms of social media. Of all the media forms mentioned on the reservation, cell phones, social media on the internet and the local independent radio station are the mainstay of transmitting information.

We don’t know about it until after it happens. Like, if it was going on, someone will call and tell the radio station about it and they’ll say it over the radio or some people call and tell you, some people call other people and then those people call and tell you, their way,
their way of saying it. It gets out. But we also use the internet; some people can’t live without it and some can. I can’t live without that. That’s where all my friends are; everybody’s on FaceBook.

-Karla, 006- 22 year old rural Lakota Woman

Nancy (009), another rural resident said she gets hazard info from her auntie, from Facebook, and the local newspaper, but she also said that no matter where she got her information, in order to take a hazard threat seriously she would "have to call around a little bit more, and if it’s verified, then we usually come down here to my aunties." A benefit of confirming hazard information with her auntie is that the information is not just thrown at Nancy. For instance, if upsetting information came to her about an encroaching wildfire, Nancy said she would be really nervous, but getting the information from her relative would allow her auntie to calm her down in the process by reassuring her and by talking out the different aspects of the hazard. Others rural participants said they depend on the radio, as well as on public warning systems such as the police or warning sirens.

Mostly it would be the police and the radio. That’s when they really take it seriously, whenever they announce it on the radio and they tell the police, and then if the police comes around here and starts talking on loud speakers.

-Randy, 003- 43 year old rural Lakota Man

Well, here we don’t really get much information. Mainly just from the police or radio. Or we just end up calling each other. So that’s how the word spreads. Mainly the police are the ones that come around with the PA systems, just saying keep people to inside or go to their basements if it’s a tornado.

-Kevin, 012- 48 year-old rural Oglala Man: EMT/1st Responder

However, Arlene (002) also said that while the community warning sirens and police PA systems may announce threatening weather, she and her husband Kevin (012), still verify the threat by going outside and to use their weather spotters training, to "read the clouds." They said they then relate their findings and relevant information to neighbors, the police and the local reservation radio station for public distribution.
Many of the urban respondents reported they obtain hazard information through similar technological sources similar to that of their reservation counterparts (TV, radio, social media, cell phones), and that they also try to verify the information through their social network—through verification of hazard by checking out the validity of information with person in their social network, because, as with the rural group, the mainstream news media is not always reliable or accurate.

The day of the North Side tornado we just happened to start playing a movie and we looked outside just to make sure there wasn’t no storms coming. I looked outside and I said, ‘dang, it’s really grey and dark over there.’ We turned the TV to the news for a second to see if it was coming our way and it wasn’t coming our way so we turned it back to our movie. It looked like they were saying that it was not gonna come to North Side at all, but it must have shifted and approached North Side right away. So I would believe the people that called and then watch the weather for ourselves, and if we see something coming then we’ll send the kids downstairs. But, other than that, there really isn’t nothing else we do.

-Rita, 016- 39 year old Urban Lakota Woman

After obtaining baseline information in that manner, then I watch the weather channel and the satellite Doppler, you know, ‘what does that look like and how is it moving?’ because you usually can tell where it’s gonna go right? in sort of motion-stop. And back home on the Rez that’s what I do. I use my I-Phone, to just look on the weather map and it shows exactly where it’s coming and it’s been always accurate.

-Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopalian Priest

Although Blizzard Bill (022) spends most of his time in the urban metropolitan area, he also returns regularly to his Native reservation to attend to work on the family ranch and to attend to other family related business. Regarding recent wildfires that raged across Blizzard Bill’s home reservation (where the rural interviews were conducted), Bill stayed informed via social media.

"My cousin was sending me photos as it was burning at night, scary stuff. I was also seeing it through FaceBook, unfolding with people who were kind of in its path, or were on their phones FaceBooking and texting and stuff. And then I heard about it on the radio station.

-Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopalian Priest
During the interviews, in order to get the interviewee to think about abstractions such as risk, respondents they were often presented with a fictitious scenario or vignette in which a hazard event takes place. For example, as previously mentioned, when asked to describe what might happen in the event of a radiation leak from the nuclear reactor south of the city when presented in a vignette, one of the urban interviewees, Pamela (021), addressed the question with a real story in which there was a reactor leak. However, disturbingly, in the real story she told, she found out about the radiation leak before any state-level authorities. The social capital of her community activism seems to have paid dividends in avoiding an imminent hazard. But, this is not surprising considering Pamela’s experiences and activist history. Pamela has extensive community organization experience dating back to the beginnings of the American Indian Movement (AIM) in 1968, and she continues to be active in community preparedness in terms of developing a reliable medical triage clinic system for the people in the community. Pamela’s past experiences have diminished her trust of what she hears in the media. Pamela said that if there was even a rumor of a leak at the reactor, or any other hazard emergency, she said would seek information through contacting professionals at the highest institutional level she could reach. Pamela said,

I would contact the State first and find out what they know about what’s going on. I always go right to the State. I’m not gonna listen to the news, somebody telling me it’s all ok. I want some kind of official telling the community that I work and live in the community and I’m a community advocate. I would do that first. Then I would start calling the different [people], like giving it out on the ‘net what’s going on.

-Pamela, 020- 69 year old Ojibwe Woman, Activist and Community Advocate

Historically, disadvantaged groups like American Indians have endured dire socioeconomic challenges throughout their interactions with the non-Indian dominant culture. They have experienced discrimination, exclusion and a lack of access to political representation, leaving them in marginalized contexts in which they receive, interpret, and respond to hazard
warnings. Some research reports that culture supports receiving and responding to warning messages about hazards. For example, in racial and ethnic minority groups, it has been shown that minorities are less likely to take hazard communications as a serious threat, unless confirmed with other social network sources such as friends and family (Peacock, Morrow, & Gladwin, 1997). This is a factor noted in these data. However, one problem with seeking confirmation of hazards is that it introduces a delay that has been substantiated in numerous studies (Phillips & Morrow, 2007). This was supported by these data in that most of both the rural and urban interviewees did report seeking confirmation of credibility of information about hazards or disasters, such as wildfire, blizzards, and tornados.

However, responding to messages about hazards can be delayed by seeking secondary confirmation of a hazard. Respondents used social media on the Internet, such as Facebook, and nearly all respondents reported having cell phones they use to confirm a hazard or disaster. Through an audiovisual medium, like Skype or cell phone technology, information about hazards can be effectively communicated, but taking time to do so may reduce planning or evacuation time as well. While these data revealed information regarding how the research participants communicate risk information regarding natural and man-made hazards, there is still little known about disaster planning in rural or urban American Indian communities. Thus, both the rural and urban interviewees were asked about their own household disaster planning and evacuation efforts. Beyond the parameters of the worldview framework addressed above and communicating about hazards, findings regarding disaster planning efforts of the sample are discussed in the following section.
Disaster Planning

The interviews revealed that several of the rural participants gained disaster planning knowledge from both traditional Native sources, as well as from institutions to which some were exposed during their childhood and adolescence. For example, several of the rural respondents reported that they learned about disaster planning from their elders and some reported gaining such knowledge from the Mormon Church, many of whom plan well enough to shelter in place for months. The quote below is from Arlene, whose mother enrolled her in the Mormon sponsored Indian Placement Program in the 1960’s. Arlene was placed with a Mormon foster family 9 months out of the year from grades 6 to 10. The experience set a foundation for household disaster planning efforts that have influenced others she knows to do the same. Some disaster kits described by the rural group included everything from extra food, water, blankets, batteries and flashlights, to extra supplies of vital medicines. Arlene reported having a disaster kit that was well equipped. Arlene (002) and her daughter, Karla (006) described their planning efforts.

I thank my parents, my mother especially, for what she did for us, because that’s our survival here on the reservation. My food pantry is full and in my kit I got blankets, flashlights, medicines, cold packs, Tylenol, just that things I think we would need.

-Arlene, 002- 52 year old Rural Lakota Woman: EMT

I have all my stuff for my asthma. I have the pill, the inhaler, the nebulizer, because my son has it too, so I have to have everything. So like if he gets sick I have to make sure I have Tylenol, pseudoephedrine for allergies. I have everything.

-Karla, 006- 22 year old rural Lakota Woman (daughter of Arlene- 002)

As described above in the worldview framework findings, the rural group in the sample reported much more disaster planning in terms of having disaster kits in the home with items required to shelter in place for 3-5 days. Having a disaster kit on hand was reported much more frequently in the reservation group than in the urban part of the sample. For example, as state
above, 11 out of 14 (almost 80%) of the rural individuals interviewed reported having some form of disaster kit on hand in their household (which sometimes included a contingency or evacuation plan). However, only 4 out of 14 (or about 26%) of the urban research participants reported having a disaster kit in their homes. In the rural group, William (013) the firefighter, first responder and incident commander, knows the value of making disaster kits, as well as having not only professional social networks through his work he can rely upon in a disaster, but also less formal, family based social networks. It would seem that reliance on these relationships would lower one’s perception of risk.

I have enough stuff for a week. I got food. But I probably prepare a lot better than most people because I know what to expect. Like everybody says, savings, you save money for certain things or for like a rainy day. That’s one of my things, I do that. I keep medicines on hand like Tylenol or ibuprofen or something like that, cough syrup. We got a generator that as soon as the lights go off, that thing kicks on. And it’ll run for two or three days before you have to fill it up again. Also, we can always go to Gram’s. She’s prepared for anything.

-William, 013- 29 year old Rural Lakota Man: Fire Incident Commander

Among the 4 urban interviewees who reported having a disaster kit in place, there seemed to be some confusion over what a kit entails. Of the urban interviewees who stated they had disaster kits, most did not describe actual “kits” with exact types and numbers of supplies, but referred to miscellaneous items of stashed supplies like food, water, blankets, flash lights that were scattered about the home, in bathrooms, in kitchens, in garages, or on the refrigerator as part of a “to-do” list. And most urban interviewees had difficulty describing an evacuation route out of the urban area. When asked why they had no disaster kit in the home, some urban interviewees cited lack of resources, ambivalence, or time shortages as the reason.

Some interviewees reported they did not have a disaster kit because preparing a disaster kit was just not in their consciousness. One rural interviewee reported lacking knowledge of what constitutes a disaster kit, and one urban interviewee said she never considered making a
disaster kit. For example, Marjorie (021), a 62 year old urban Anishinaabe/Ojibwe woman reported she had simply never considered putting together a disaster kit, saying, “I never thought about putting stuff away like that.” Gina, an 18 year old rural Lakota woman, who had recently moved from another reservation, reported she lacked a disaster kit in her household because she also reported that she did not understand what constitutes such a kit, saying, “I never really understood what you would have for a disaster kit. I know my grandma always carried one with her in her car.” However, Gina is also close to her uncle, who lives locally and is well prepared for tornado season, as well as other hazards. Gina (007) said, “My uncle bought a trailer house and he paid for it to get it cemented to the ground.”

Some cited other reasons for not having a household lacked disaster kits in place:

- I don’t have a kit. I think it’s due to a mixture of not having money and space. -26 year old urban Zuni Pueblo Woman

- It’s like anything, you just sort of go with what everybody else is doing and not doing. -Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopal Minister

- I think I got too many things to do. And in the community, we have no disaster plan, there’s no shelters. I remember back in my day, they were building shelters, bomb shelters, but now there’s nothing here. -Deborah, 015- 59 year old urban Annishinaabe/Ojibwe Woman

Paralleling this lack of interest or action regarding disaster planning, one interviewee who serves as a community organizer in the urban area said that while she performs disaster planning outreach in the community, she also says most people do not think about planning, and are thus not likely to plan for something that may not happen.

- We had a couple of trainings on disasters, how to utilize the Clinic as a disaster area; how to get information out to the people of the community. If there was an emergency then we would utilize our grant, our group from the Native American Clinic and do a triage type outreach and get that clinic opened to whoever we need to open it to. But right now I would say that the atmosphere about the people is that they’re not worried about any kind of disaster, at this point. It’s just that we’re in Minnesota and this stuff hasn’t happened very often, except for tornados. I don’t think it’s a good thing. I think we
should be prepared for anything, but it’s hard to stay in that mode, to be prepared 24 hours a day 7 days a week. It really is not anything you’d imagine happening.  

-Pamela, 020- 69 year old Ojibwe Woman: Community Advocate

In terms of evacuation planning several in the urban sample said they were simply ill prepared to evacuate or leave the confusing and congested streets of the city. For example, Marjorie (021) said, "I don’t Know. I’d probably just follow everybody else.” Others in the urban sample admit that evacuation from the large metropolitan area would be extremely difficult, sometimes describing evacuation of a city in terms of conflict in competitive shopping.

I don't know how to evacuate from Minneapolis. It’s crazy, the way it’s laid out. I could just see, all the interstates would be clogged and stopped. It would be a mess.  

-Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopalian Priest

It would be hectic because if you look at the freeways you only see one person in their cars all the time. But they should make something for people here to get out of the city if we have to; a route, a plan, make people understand, because it would probably be a disaster. It would be dangerous, people killing people, like shopping on Black Fridays.  

-Wanda, 023- 55 year old urban Anishinaabe/Ojibwe Woman

From the above examples of disaster planning and preparedness there is a fair amount of awareness that environmental dangers hazards pose, as well as concrete efforts by some to increase safety in terms of environmental hazards. However, others in the sample seem less aware and take no pains or efforts to make useful disaster kits, make plans for different hazard contingencies, or to make evacuation preparations to leave an area if the need arises. In essence, there is much variability in disaster planning, especially when the rural and urban samples are compared.

From these data presented above, it is clear that the research participants place a significant amount of trust in the words of friends and families when it comes to communicating and confirming information about hazards, and that the rural and urban groups differ in terms of disaster planning. In addition to the particular hazards (natural and man-made) that reveal and
exacerbate vulnerabilities (social, economic, political), and the information about communication and planning, both the rural and urban groups have similarities and differences in terms of their sense of trust through which they relate to federal and tribal institutions that deal with hazards and disasters. Examples of how the interviewees relate to tribal, state and federal institutional level authorities are presented below.

Trust in Tribal, State, Federal Institutions

A person’s risk perceptions involve attitudes and judgments about what is or is not dangerous in the environment and is mediated by a host of factors, including social trust (Burger, Roush, Ramos, & Gochfeld, 2000; Slovic et al., 1979). Some studies support that trust plays a role in the variance of risks and benefits associated with hazardous technologies (Siegrist, Cvetkovich, & Roth, 2000), while others support other “unknown” effects as more explanatory than is social trust, in terms of risk perceptions (Sjoberg, 2001, p. 189). However, as Siegrist et al. (2000) state, the value of social trust in risk perception research depends on how trust is defined. Trust here is defined as confidence in social institutions to help American Indian communities plan for and respond to hazards and disasters. This is important because most of the interview sample has been involved, directly or indirectly, with tribal and non-tribal institutions as part of their trust relationship with the federal government that has been constructed over the past several generations. These links to institutions are especially clear in the disaster experiences described above concerning blizzards, tornados and wildfires. Relationships between tribal members and institutions that deal with disaster planning are important, from the level of the individual and the household, to the larger levels of tribal, local, state and federal entities. Below are several examples of the trust and lack of trust that the
interviewees reported regarding tribal and non-tribal institutions that have dealt with hazards and disasters in Indian country in the past.

Some interviewees said they completely distrust the federal government, others said they trust the state authorities more than the federal authorities. Still others felt that trust in the federal government was contingent on which individuals represent the government, and some distrust authority figures of all types. For example, when asked if she trusted the federal government to help Indians plan for and respond to disasters, Justine invoked the omnipresent awareness of historical trauma and the long history of broken treaties and broken promises that American Indians have had with the U.S. government. Justine (018) responded, “Do I trust the government? No, just ask any Indian.” Other research participants join this distrust of the government for justifiable reasons from their perspective.

On all the reservations, the federal government, it seems all they do is take everyone to prison or take ‘em to jail.
- Deborah, 015- 59 year old urban Anishinaabe/Ojibwe Woman

I don’t trust them because most of their money making [efforts] are from the war and medicine.
- Wanda, 023- 55 year old urban Anishinaabe/Ojibwe Woman

We’ve been through everything. We been through relocations, army concentration camps and POW camps, you know, genocide through everything from education to housing, health care, and here we are, still here.
- Vincent, 014- 28 year old Rural Lakota Man: Activist

When asked about trust in their tribal council’s abilities to perform disaster planning and other tribal affairs prudently, some respondents seemed to trust tribal government to look out for the interest of the tribe, while and others did not. Interviewees who reported having close connections to tribal governments, through having close friends or family members serving on counseling bodies, expressed more trust in tribal council as an institution, than did those who do not have close ties to tribal councils. Several respondents were more ambivalent saying that they
do not trust tribal council “as a whole” (014). For example, urban participant, Deborah (015), said "my ex-brother-in-law is on the council and so is a friend of mine. So yeah, I trust them."

Both Blizzard Bill (022), an urban Lakota Episcopalian minister who frequently returns to his home reservation, and Vincent (014), a rural Lakota community activist, think tribal council does not perform very well in terms of confidence, trust or parity.

You know I’d like to trust ‘em but their track record is not that good. It’s because of graft and corruption and all that stuff. I’d like to think that if a disaster occurs that people would drop everything, the politics and all that, and they’d come together and help one another out, I’d like to think that.

-Blizzard Bill, 022- 49 year old urban Lakota Man: Episcopal Minister

Maybe some individuals on the council, once they all get together and sway one way, it’s all about a vote. If you get ten people on your side on the council, then you get a go through. And I worked for a councilman for five or six years as a federal monitor, so I know what goes on at all the meetings. I was district president, district vice president. I was president of student council at the college, so I’ve been through all seeing how everything works like that within a group like that, where you get voted in and you make decisions for a lot of people, and sometimes, most of the times, you don’t get the people’s input. So I don’t trust them as a whole.

-Vincent, 014- 28 year old rural Lakota Man: Community Activist

Some interviewees said they barely trust federal disaster institutions, while having outright disdain for tribal government. These institutions are apparently perceived as driven by greed, nepotism, lack of procedural efficacy and corruption.

 Mostly, they’re all [tribal council] in it for themselves, with money, like yesterday they had a tribal council meeting, and it aired on the local radio station, and I listened to it. You have to have a quorum to make any decisions, but a lot of them left, so they didn’t have a quorum to get done with a lot of the things that need to do to help this reservation.

-Randy, 003- 43 year old rural Lakota Man

It’s their families that are in the jobs that involve helping people. If you ain’t part of their family or you don’t know them, they won’t help you, so why even bother, you know, knowing it’s already like that.

-Lawrence, 010- 25 year old rural Lakota Man

There’s embezzlement over the casino and misuse of funds.

-Lisa, 004- 28 year old rural Lakota Woman
During the blizzard we were out of power for three weeks and out of water for like four weeks, and we come to find out the tribal chairman was out in the City in a hotel room.

-Gina, 007- 18 year old rural Lakota Woman

We had a Tribal leader that was in office I’d say a good 15 almost 20 years, we had nothing. He owned a home in Los Angeles, one in Paris and one in Hawaii. While we were struggling for social service programs, him and his family were wearing diamond and jewels and he was wearing $3000 suits. Hey, some of our people couldn’t afford shoes for their babies.

-Samantha, 65 year old urban Lakota Woman

The most alarming story regarding mistrust of the federal government involved a hazard training session that resulted from a federal mandate that tribes must plan for pandemics in rural reservation communities. For instance, Arlene described a chilling experience while training for rural pandemics, an experience that raised her sense of danger even more so that did the idea of a pandemic. She said,

We sat down and made our plan. We made a quarantine area with a 5 miles radius, we decided where our morgue would be and where our triage would be, but what I didn’t like about that most of all was that it would be only the medical personnel would get treated at first. And then, we’d have to triage to decide who gets the shots next, because there won’t be enough for everybody. And we’d be the only one in control of that clinic. To triage and have to decide who lives and who dies really set me off, to think that I would have to decide that a person can’t get the shot because they are too old or if they’re too sick. If it really came down to it I dunno if I could make that decision.

-Arlene, 002- 52 year old Rural Lakota Woman: EMT

Arlene’s disconcerting experience with the idea of gatekeeping life-saving medications in the event of a pandemic presents a dilemma. On one hand she is well trained to run a pandemic triage. She could build further on the trust the community has with her from her 18 years experience serving the community as an EMT. However knowing there would not be enough medicine for everybody in the tribe, and that she would have to make life and death decisions, lessens her trust of the federal government and raises her perceptions of risk associated with pandemics.
Trust can be used to manage the uncertainty of personal risk through externalizing and transferring one’s locus of trust to authority figures and the institutions they represent. Trust, or lack of trust, in authority figures and institutions can have a substantial impact on perceived environmental risks (Wachinger, Renn, Begg, & Kuhlicke, 2012). In risk perception research, trust (the belief one can rely on others), and confidence (the belief that everything is under control and uncertainty is low), has been neglected (Siegrist et al., 2005). Trust is a multidimensional construct based on shared social relations, values, and group membership. Trust involves risk and vulnerability, whereas confidence relies on having a high level of familiarity (Siegrist et al., 2005). Lack of trust in the general honesty of people has been shown to be negatively correlated with risks perceived (Siegrist & Earle, 2005; Sjöberg, 2001).

Risks and perceptions are more abstract than concrete. Unlike concrete objects, risks cannot always be perceived by relying on the senses. Instead, direct and indirect signals are often collected, selected and interpreted about hazards and risk perceptions during times of uncertainty; these internalized signals create mental models, images and “cognitive heuristics” that people use to frame their risk perceptions. These mental models of risk perceptions are “reinforced, or modified, amplified or attenuated” under the influence of media, peers and communication processes (Wachinger et al., 2012, p. 1).

Culturally influenced mental models may relate to how the American Indians in the study frame risk perceptions of their past in perilous turbulent interactions with European-American’s westward “progress” of the doctrine of Manifest Destiny, as well as how they negotiate trust in the ever changing federal and tribal institutions charged with enhancing the safety and well-being concerning technological and/or natural environmental hazards. Since 1988, federally recognized tribes have had to increase awareness of the natural and man-made hazards
reservations face, communicate the impacts, attempt to mitigate current dangers and plan for future hazards through their respective state governors, who served as gatekeepers to access federal assistance regarding various phases of disaster experiences. However, recent amendments to the Stafford Act¹ have altered the procedure through which tribes can choose to seek federal assistance with disaster planning (as well as other phases of the disaster process). This amended Act opens the door for tribes to access federal disaster planning and response through the President, and to possibly seek funding for planning through the department of Homeland Security. However putting the onus of disaster planning back onto the tribes presents a problem; many tribal members do not have high levels of trust and confidence in the federal government to fulfill promises, nor do many trust their own tribal councils and governments to be able to carry out such mandates in a fiscally responsible manner. In terms of perceived disaster risk reduction for tribal members, trust is important because “high levels of trust and confidence reduce perceived risks, compared with low levels of trust and confidence” (Siegrist et al., 2005, p. 145).

Trust in tribal government is contentious but some tribal members seem to be more a part of the social structure and institutions on the reservation. For example, when asked about Keystone XL’s efforts to run a tar sands oil pipeline across the reservation, Arlene (002) said the council stopped the bid for development, with "tribal government standing strong with it." However, Arlene may have more insight into how tribal council actually functions. As a long-time EMT on the reservation, she said that she participates in the official hierarchy of the tribal social institutions, so she may be more inclined to trust tribal government because she has long

¹ Until January 23, 2013 American Indian and Alaska Native communities did not have the ability to seek a Presidential disaster declaration from the U.S. Federal Emergency Management Agency (FEMA) without first gaining state approval through their state’s Governor. In 2013 the U.S. Senate passed the Disaster Relief Appropriations Act of 2013 which includes a provision that would amend the Stafford Act to allow federally recognized Tribal governments to directly make requests to the President for federal emergency and disaster declarations.
known more of the details of how government works on the reservation. Yet, Arlene is also ambivalent. She later said she did not trust tribal council when it came to some internal matters, mostly because “they’re just another group of politicians.” Kevin (012), Arlene’s husband and also long-time EMT, trusts some institutions on the reservation as well, though, again, not necessarily tribal council. For instance, unlike a few others who criticized the lack of fire services in the community, Kevin (012) tends to trust the fire department to arrive at a fire site in an appropriate amount of time to be effective. Kevin said of the fire department, “they have a good response time. It takes them like an hour to get here, but the locals can usually try to keep it under control.” However, as with Arlene, Kevin has also worked on the ambulance service for many years and is closely tied with many tribal institutions that many other interviewees are not. Perhaps Arlene and Kevin view their trust of tribal institutions through a reverse lens; reflecting how many people and institutions on the reservation trust them.

Lori, a 44 year old urban Indian woman of Omaha and Lakota heritage and mother of three, said she did not trust federal institutions such as FEMA and The Army Corps of Engineers. She said this sentiment is based on cultural insensitivity her mother experienced with these institutions during the threat of a large flood near her home. When asked if she trusts agencies like FEMA she related a story about her grandmother and flood risks that did not go well because cultural taboos were unknowingly broken by FEMA and The Army Corps. Lori (025) said that the representatives from these agencies just came barging into her mother’s home telling her she needed to evacuate immediately. Although the representatives may have felt they were helping Lori’s mother, their flood warnings were rebuffed as the representatives ignored tribal customs and totally alienated her mother, which further undermined Lori’s trust in the institutional agencies.
It was just like one day they FEMA showed up and they’re like, “you need to move because we’re anticipating this flood.” They just whipped out all these big maps for her to look at. She is a retired judge for the Tribal courts and everything, but it was just the way they showed up. And so my mom calls me and says, “I had these White guys just basically come right into the house and demanding I move” and “I ain’t moving nowhere.” So I got all the information and explained it to her because I knew she wasn’t going to believe a non-Native person, much less a person she has never even seen before. It would have made my mom a lot easier [if FEMA knew that] you approach an elderly female differently than you approach a man, an elderly male.

-Lori, 025- 44 year old Omaha/Lakota Woman

But Lori said her mother placed more trust in the “spirits” than she does culturally insensitive representatives of large institutions. Lori’s mother said of the potential flood,

“I’m not worried about it, I already prayed about it. It’s not gonna come, they already told me about it you know” She said, “I prayed and the spirits would tell me.” She said, “I got faith in the creator and this isn’t gonna happen.” She says, “I put my water out for the water spirits” and she said, “they know me.” And like how we believe, you make a food offering to the water spirits. But each part of your family, you take a little bit of their clothing and you put it in this little bundle and then you offer it to the water. So when we’re in the water them water spirits are always looking for something you know.

-Lori, 025- 44 year old Omaha/Lakota Woman

While trust in federal and tribal institutions is important for effective disaster planning within and between tribes, and between tribes and state and federal government, the general lack of trust mentioned in the interviews, in terms of tribal, federal and tribal governments, is concerning. However, several of the research participants displayed a strong sense of agency in their ability to adapt to having two, or sometimes three, different cultural worldviews, which may provide some of the respondents an advantage that many in the mono-culture of the mainstream, dominant social paradigm may lack. Below, worldviews are discussed in terms of how many of the American Indians in the sample incorporated different aspects of life in pragmatic ways that make them resilient during times of social change. This involves the American Indian experience of living in both their tribal world and that of the larger dominant culture of American society.
Worldviews: A Foot in Two Worlds

When the participants were asked to compare how they thought American Indians and non-Indians see the world, the interviewees reported a wide range of themes that differ between the weltanschauung of the two perspectives, as well as some factors that are similar. One of the most interesting aspects of worldviews that came up in the research is how of 50% of the rural and 36% of the urban group, spoke either directly about living in two worlds, or described examples in their lives that illustrated the concept of having to navigate at least two different worlds and worldviews. It is clear that some of the interviewees’ lives portray a blending of both Western and American Indian worldviews in some domains such as educational pursuits. For example, over 40% of the rural sample and 57% of the urban sample reported spending time in Western-influenced educational institutions, seeking or completing a degree (Associates, Bachelors, Masters) in higher education at Westernized mainstream colleges and universities. The quotes below depict other types of bi-cultural experience of living-in-two-worlds in several domains, including medicine, religion, and culture.

I have lots of ceremonies. I think that’s how I stay healthy. They are doctoring me, and drinking Indian medicine, and I still take the white man’s medication too.
-Diedra, 001- 61 year old rural Lakota Woman

I have my family, who speaks Lakota and tries their best. We live with horses and buffalos, and we live natural as we can. But at the same time, we gotta go to town every day, get our gas every day, go to the store every day. We got to go back to that world and then we cross the gate and we come home and try to think Lakota, live Lakota you know. So living in two worlds is hard for people, you know? And there’s indigenous people all over the world living in these two worlds, trying to hang on to that identity, when colonization is just pulling us so hard this way, you know. So we live with that colonization every day. It’s hard for us, on our people. We live with that historical trauma that’s still fresh to us, you know. Everything is fresh to our people. It’s only a few generations here, especially for the Lakota people. We’re the last of the so-called Indians who resisted and fought and wanted to live our natural way of life. So we still have historical trauma. It’s only been a few generations since people had to turn life around and live a new way and talk a new way and think a new way.
-Vincent, 014- 28 year old rural Lakota Man: Community Activist
I look at it as being bicultural because I try to live as close as I can to my culture, while having to do what I need to do in the White Man’s world; I have to work, I have to have that money to pay them bills, but yet with my 15-day-old baby I’m going to try to do a traditional use of the cradleboard, give him his Indian name, be around the language, and so it’s just walking that fine line of being in two worlds, and try not to let them crash into each other.

-Lori, 025- 44 year old urban Omaha/Lakota Woman

I respect my Lakota way, but I’m also glad for the non-Indian way because my son gets to go to school and learn things. But he comes home and my grandma talks Lakota, and so he learns both. He came home, and he says “I know how to say turtle!” And he said “kia.” I said “Cool. I didn’t learn that until just last year.”

-Nancy, 009- 25 year old rural Lakota Woman

Interestingly, one rural interviewee clearly recognizes two different worldviews (Western and American Indian) but said she would prefer to hide the American Indian side of her identity and try to succeed in the outside White world, to pursue opportunities off the reservation.

There’s a lot of the White world in our culture now out there. Everything’s out there. Here there’s nothing. There’s no jobs. There’s nothing really out there for to reach out and get. You know, if you get it you take it. There’s not really nothing to fall back on or anything. I try not to let my culture destroy my White world, because that’s always gonna be with me everywhere I go. And that’s why I pray for strength and everything, so I try not to put that out anywhere somebody’s gonna criticize me over it. I wanna go to live off the reservation and experience more than what’s here after I get done with school. So I try not to see it in 2 different worlds. I try to live in just one. But yeah, there’s some people that see it in two. They always say, ‘the White man’s the one that bring the alcohol, the White man’s is the one that introduced us to trading and losing and the White man overpowered the Indians.’ So there’s some people out there that live in 2 different worlds. They don’t like the White world and they would rather be here and, you know, suffer.

-Lisa, 004- 28 year old rural Lakota Woman

Other respondents reported conflict from living in two worlds as they run the risk of losing their American Indian identity by living in the urban area for so long.

It’s hard to be Indian. I mean, I’m Indian but I have a hard time following my traditions and that. I wanna follow ‘em but sometimes I don’t know ‘em all the way. Like when I was growing up I thought we were all one. I didn’t know there were different Ojibwe. I didn’t even know I was red. You know, I just knew I was Indian. I didn’t know that we had Ojibwe and this. I just thought we were all Indians.

-Wanda, 013- 55 year old urban Annishinaabe/Ojibwe Woman
The particular hazards and vulnerabilities faced by the rural and urban samples, the ways in which the research participants said they communicate about, and plan for, natural disasters, as well as their sense of trust or mistrust between the Indian peoples and the federal government and between tribal members and their own tribal councils, have influenced risk perceptions for the study sample in ways that the axes of the worldview framework alone just cannot explain. Additionally, there was a tendency for the participants in the study to talk about traditional ways when it comes to hazards and risk perceptions, but also to behave differently, in many ways that are part of the modern, dominant social paradigm of the Westernized world. Much of the interview data included topics such as balance with the natural world, having a particular sense of time and space, valuing the group over the individual and generally seeing the world through a holistic lens. This “naturalistic” framework produces conflict for many in the research, yet many others said they have adapted to living in 2 worlds. This idea of “living-in-two worlds” is returned to later in the discussion chapter.
CHAPTER 5
DISCUSSION

In this chapter, the findings from exploring the worldview framework will be addressed. After that, alternative factors regarding risk perception and disaster planning in the sample will be considered, some of which will stem from the themes presented in the results chapter. Finally, the limitations of the study and the recommendations for further research in this area will be addressed.

To quickly summarize the comparisons in the worldview framework in the previous chapter, four of the five axes evaluated in the framework provided information about the links between the various aspects of indigenous worldviews. However, the three phenomena in each axis did not directly “funnel” down to some sort of relationship with disaster planning. Thus, while experiencing time/space through an indigenous lens (Axis 1), thinking about the world through an indigenous type of process thinking that includes content and state merit (Axis 2), relating to the world through a collectivist perspective and reliance on social networks in a disaster (Axis 4), and being in the world in an indigenous type of holistic perspective (Axis 5), most of these axes seem to point to more disaster planning, but this seems to apply only to the rural group. Considering this, it may be that some of these axes of the worldview framework say more about having a sense of ambivalence than it does about disaster planning for the sample as a whole. Moreover, whether or not the sample chose to plan for disasters seems more tied to location (rural vs. urban) than it does to this axis of the worldview framework.

Ironically, while the urban group reported knowledge of a wider range of environmental hazards in the local area, they were also reportedly less prepared for disasters than was the rural group. This fits well with the literature on the subject, as disaster experiences can be very
different for rural and urban populations (Cross, 2001), but lack of disaster planning on the part of the urban group may also have to do with ambivalence. As many of the urban respondents made clear, planning is easily lost in the milieu of a million services accessible in the city where there are so many more support services compared to rural reservation life. In the urban area, support services, agencies, first responders are so prevalent and ubiquitous that perhaps, that its “normalization is in play; the upshot is that some urban American Indians (as well as many other minority groups) respondents do not have to think about planning. While the urban group appears to be more knowledgeable of hazards in their local environment, perhaps easy access to emergency services may make them feel more insulated from potential devastation by being enveloped in the multitude of interdependent and overlapping amenities of urban life. Indeed, some researchers support that after a disaster restoration of basic services is more rapid in cites than in rural areas (Cross, 2001).

Yet, a word about the salience of the particular types of hazards faced by the rural and urban groups in the study may be warranted in order to explore why the urban group reported awareness of a wider range of hazards than did the rural group. This distinction may be related to the types of hazards faced by the rural and urban groups. Some hazards are better known in popular parlance by their frequent mention in media and by their sheer devastation potential. For example, many in the urban group reported that the most frightening hazards in the area were the 3 nuclear power plants that surround the city, and the prevalent soil toxicity in the southern part of the metropolitan area. Both the nuclear power plants and the arsenic laced soil are well-known and prevalent in the minds of most people in the urban area, not just for the American Indians enrolled in the study. The potential for radiation leaks and arsenic poisoning have been
regularly noted in the media over the past 30 to 40 years. Thus it is no surprise the urban part of
the sample would cite these as common local hazards with which they are aware.

On the reservation, many of the hazards mentioned by the interviewees dealt with
blizzards, wildfire and fear of water contamination of the Oglala aquifer from leaks in the
proposed XL tars sands pipeline. The last of these is has been a bit less well-known in the
dominant culture until the American Indian demonstrations and blockades became common on
the internet through social media such as YouTube. There are numerous accounts in social
media regarding how tribal members on the reservation in this study blocked the XL pipeline
trucks from crossing sovereign, tribal lands with over-sized loads. Several of the rural research
participants said that the truckers were trying to avoid paying dues as on the interstate highways.
However, when the blockade began, unless one lives in the region or is closely tied to the
reservation, some of these hazards are still not very widely known. Other hazards are well
known by everybody on the reservation. For instance, nearly everybody on the reservation, and
the national media as well, was made aware of the wildfire that burned an area the size of the
City of Chicago in the late summer of 2012. However, like many risk factors, when the
immediate threat is over the impact of the salience of the story tends to fade for most people,
except for those who experienced the disaster first hand. Nonetheless, wildfires have been part
of the mainstream media during the last few summers, as well as a recent daily experience in the
local environment of the rural reservation. Thus, it stands to reason that the rural interviewees
would be aware of such well-known hazards.

While parts of the indigenous worldview framework may be of some value in exploring
risk perceptions and disaster planning in this limited sample, it seems the framework as a whole
may be good for assessing insights regarding the links between worldviews, ambivalence and
trust in terms of risk perceptions and disaster planning. Below, these factors are discussed further.

Ambivalence

There seems to be a sense of ambivalence in terms of disaster planning for the urban group. Several participants discussed a sense of feeling insulated from many hazards due to the multitude of emergency services in a metropolitan area. Some respondents said they felt less vulnerable in the city. Despite research that has described larger, metropolitan, “mega-cities” as more vulnerable to a disaster because of their “complexity and accumulation of population and infrastructures,” (Cross, 2001, p. 64), many in the urban sample held the opposite view of the city in terms of risk perception (and reported more familiarity with hazards in the local environment). In Axis 2, of the worldview framework, as with all of the axes, the urban group reported significantly less disaster planning than did the rural group, yet the urban group in Axis 2 also identified more local hazards than did the rural group.

Perhaps process thinking (with content and state merit) plays into this discrepancy; it was assumed that higher awareness of hazards would lead to more mitigation actions for both the rural and urban groups. With nearly 75% of all American Indians residing in urban areas in the U.S., they are exposed to processes of disaster planning, response and recovery that may carry a certain amount of content merit (by their relevance) and state merit (by how the process of urban disaster management is carried out). Although content and state merit were sometimes referred to above in terms of belief practices often associated with cultural experiences, such as ceremonial processes, this type of merit can also be carried by those who perform hazard management services in the processes they carry out in urban areas. It seems likely that the
Ambivalence towards household disaster planning in urban areas seems a logical outcome considering the amenities of many cities in terms of disaster planning and mitigation. For example, cities tend to have a lower per-capita cost to provide emergency services than do many rural communities; urban first responders already have appropriate mitigation and response techniques in place; cities tend to employ more well equipped full-time disaster managers than do small rural communities; many cities have mutual aid relationships in which they share disaster mitigation and response activities; In most cities there are abundant medical and emergency services; hazard warning equipment is generally more prevalent in cities. Finally, since investment in disaster planning is much greater in wealthier cities than in rural communities (Cross, 2001), it is not surprising that the urban group is more aware of local hazards, but does little to plan for disasters. So while the urban group may have utilized the critical thinking skills involved in having content merit (face validity) and state merit (value in the process of how something was learned) a bit more than the rural group in terms of identifying local hazards, this does not seem to carry over to influence household disaster planning.

To help frame the discussion above, ambivalence seems to provide insights into disaster planning in other axes of the worldview framework as well. For instance, while Axis 1 dealt with cycles of time in which some sort of cosmic end-of-times or end of a natural cycle is expected to cause a major epistemological shift in the world, or outright destruction in the future, this perspective presents a formidable level of uncertainty for the person who believes it to be true. But taking this stance may also provide a coping mechanism for such uncertainty; it may permit one to externalize their sense of control, however this could result in sense of
ambivalence because of increasing feelings of inability to control or to change the outcome of the world, on an individual or collective level. Ambivalence may stem from an inability to control or respond effectively, to either the rise in disasters or the imbalance. This ambivalence could inhibit taking “effective action” in terms of ameliorating risky conditions (Weigert, 1989).

Ambivalence has been identified as having three main types; affective, conative and cognitive. In affective ambivalence a person has both positive and negative feelings about a situation or phenomenon. Conative (voluntary) ambivalence involves “conflicting wishes” that make it difficult to decide on a course of action. Cognitive ambivalence describes holding contradictory ideas about a phenomenon (Merton, 1976). Holding positive and negative feelings, having conflicting desires and/or possessing contradictory ideas, all seem relatively close in meaning; all present marginal zones between the negative and positive poles, as well as between having conflicting desires and contradictory ideas. In the results chapter, some of the hazards and vulnerabilities presented for the rural group provide instances that could support one’s sense of ambivalence in the world. Some of these involve aspects of a Lakota worldview and culture that frames risk and interpretations of danger. For example, Leonard (008), whose father and uncle died during the blizzard exhibits elements of affective ambivalence. During the interview Leonard seemed both passionate and humble about participating in the cultural events of his tribe, gregariously describing about how much he has learned since being back on the reservation, and how much there is yet to learn about his Lakota culture. He described both positive and negative feelings about his deep need to be on the reservation, and the isolation, great economic needs and poverty conditions with which he has to cope in doing so; as several interviewees stated, clearly jobs are hard to find on a reservation with an 80% unemployment rate. Leonard also described negative and positive feelings about fulfilling his cultural
obligations in the geographic isolation and danger experienced during the blizzard of 2008. Although Leonard was safe and warm in the community shelter, answering the pull of fulfilling cultural expectations by going to his father’s wake ceremony he risked his life walking blindly into the sub-zero temperatures and blizzard conditions to get there, much to his family’s dismay. With all the family vehicles broke down and no way to leave the reservation, the blizzard conditions only served to remind Leonard of how difficult life can be in such rural isolation. Economic, cultural and structural contradictions such as these, present the potential for ambivalence that could “block effective action” in terms of ameliorating risky conditions (Weigert, 1989, p. 73).

Also from the rural group, Vincent (014), the 37 year old Lakota activist and community organizer a displayed conative ambivalence of holding “conflicting wishes,” in that in his various formal and informal roles he sees the long suffering of tribal members living in economic dire straits, and simultaneously knows that the tribe takes in over $1 million per month at the tribal casino that is never shared with most tribal members. Vincent said he is conflicted; he does not like to criticize his tribe, nor does he like conflict with other tribal members, but he also feels obligated to help his tribe by a activism that highlights disparity. Moreover, Vincent knows well from working closely with the tribe that some members of tribal council live more lavish lifestyles while most of the people do not. This makes it difficult to decide on a course of action, do something about either addressing tribal corruption, or addressing economic vulnerabilities.

Cognitive ambivalence, which describes holding contradictory ideas about a phenomenon (Barber, 1976) is also evident in the sample. Cognitive ambivalence is noted in the Arlene’s words, the Lakota first responder and pandemic trainer who expressed outrage that the federal authorities expected her to decide which tribal members can access pandemic treatments and
which cannot. This experience provides an excellent picture of how content and state merit (from Axis 2) are intertwined with “trust.” Since so many of the participants described participating in practice beliefs, some ceremonial some secular, which contained both content and state merit, this phenomenon requires more explanation in order to understand how merit may play into interpretations of risk, and subsequent disaster planning. Axis 2 actually deals with the legitimacy of actions and social processes. Understanding of one’s history, making decisions, doing practices, and participating in community are all phenomena which, to be considered acceptable or legitimate, must convey a sense of having content merit (in that the processes or decision must be reasonable, relevant and sufficient to the situation at hand) and state merit (in that the processes through which people come to make decisions or develop what seem to be valid opinions, are guided by the ethical acceptability of how one comes to know, or decides to do, something).

Diverging somewhat from strictly a discussion of Axis 2, legitimacy of social processes and trust can be explored here as well. In the results chapter, trust was defined as confidence in social institutions to help American Indian communities plan for and respond to hazards and disasters. In risk perception research, trust (belief one can rely on others), and confidence (belief everything is under control and uncertainty is low), has been neglected. Trust is a multidimensional construct based on shared social relations, values, and group membership. Trust involves risk and vulnerability, whereas confidence relies on being in the high level of familiarity (Siegrist et al., 2005). Lack of trust in the general honesty of people has been shown to be negatively correlated with perceived risks; higher trust is linked to lower perceived risk (Siegrist & Earle, 2005: 147; Sjöberg, 2001).
Mental models of risk perceptions are influenced by a sense of trust. Worldviews are “reinforced, or modified, amplified or attenuated” by social interaction and social processes (Wachinger et al., 2012, p. 1). In Arlene’s pandemic training experience it is easy to see how trust was broken and risk perception was amplified. The pandemic training she described depicts not only contradictory ideas about a phenomenon (by saving some people, but killing others), but also the crisis that can accompany a loss of apparent social structure, to create an in-between state, when one’s long-time trust in an institution is broken (Turner, 1969). When Arlene spoke of her service on the ambulance squad it was evident that she held the health, medical and emergency services in high regard. Her long-time career as an EMT and first responder involved many personal and professional relationships that developed over her tenure with emergency services. As such, in her past experience she had reasons to trust the institutional hierarchy of the emergency management services. In this way, she seems to have used trust effectively, to manage the uncertainty of personal risk through externalizing and transferring her locus of trust to authority figures and the institutions which she represented. Having trust—or lack of trust—in authorities and experts can have a considerable impact on perceived risk and interpretations of danger (Wachinger et al., 2012). However, during the interview with Arlene, the trust of authority figures came under scrutiny. Her awareness that she, directly, would have to make life and death decisions for other people in the event of a pandemic really upset Arlene. Moreover, her lack of confidence and trust in the federal government to even train tribal members for pandemic outbreaks in ways consistent with cultural values is lacking. Having a federal mandate to require pandemic training processes for American Indians, and only then to inform the key triage workers there would not be enough medicine to save everybody on the reservation reveals lack of both content and state merit on the part of the government agency mandating the
pandemic training. Talking with Arlene (002) it was easy to tell that having to decide which elders live and which children die stands in direct opposition to her fundamental cultural values, and gave her pause to mistrust these particular institutional emergency services on some levels.

Risk perceptions were also mediated by trust ways that intersect with broader themes of social justice. The struggle for sovereignty and maintaining control over what occurs on the reservation, and mistrust of the state and federal hazard institutions in urban centers, has influenced environmental risk perceptions across the rural-urban continuum. A sense of discrimination, vulnerability and environmental injustice, or even environmental racism, frames the risk perceptions of several interviewees in both the rural and urban groups. Research supports that feeling a sense of discrimination and vulnerability is at times linked to value judgments of justice, which is positively linked to high perceptions of environmental health risks. This suggests that “vulnerability and evaluative judgments of injustice are central to the perceptions of risk” (Satterfield et al., 2004, p. 127). This type of relationship is noted in the research sample. In the rural group, Arlene (002), Kevin (012), Vincent (014) and others discussed the vulnerability and injustice of the tribe in terms of stopping corporate attempts to use reservation land for constructing the XL pipeline across the plains and for transporting construction hardware without paying the required duty. In the urban group, Pamela (020), Sherrie (024) and Blizzard Bill (022) all spoke of the environmental injustice of placing the Prairie Island nuclear reactor adjacent to the American Indian reservation on the small island in terms of environmental injustice. Pamela related in the interview that the Prairie Island reactor was originally planned as a coal burning power plant, and that the corporate and government entities in charge of the project shifted to nuclear power they did so without informing the tribe living on the reservation, thus unjustly excluding the voices of the people at most risk.
However, while worldviews and ambivalence may relate to risk perceptions and subsequent disaster planning in the sample, there are other explanations discussed below that may figure prominently in this discussion of worldviews, risk perceptions and disaster planning.

Alternative Explanations

Other understandings of interpretation of danger, risk perceptions and disaster planning may be taken from themes discussed in the results chapter above. For instance, the socioeconomic vulnerabilities and the specific environmental hazards with which rural and urban American Indians have to contend are but two factors that may influence disaster planning in the sample, at least as much as one’s worldview. These factors constitute multiple conditions that define the overall vulnerabilities of the sample and are important because environmental context of hazards figures heavily into risk perceptions and planning, as it can serve to either enable or constrain human actions when interpreting danger (Alexander, 2000). Socioeconomic vulnerability has had impacts throughout Indian-White relations, leaving disadvantaged groups like American Indians to struggle through socioeconomic challenges throughout their interactions with the non-Indian dominant culture. Many American Indians have experienced discrimination, exclusion from upward mobility and a lack of access to political representation, leaving many in marginalized contexts in which they receive, interpret, and respond to danger within the web of environmental and socioeconomic vulnerabilities.

The environmental hazards of a local region define the context in which hazards exist include socio-political-economic aspects of the community, local environmental conditions (Mitchell, Devine, & Jagger, 1989) and the particular geographical location of community, rural or urban. Types of hazards are important to understand in a local area because they influence the
details of mitigation and planning and establishes the context in which hazards and vulnerability intersect.

In addition to the many social, economic and hazard-specific challenges, and the “survival mode” in which many American Indians exist on reservations, the geographic isolation of the rural group stands in stark contrast to the experience of the urban group, who often reported having the luxury of a surplus of easy to access emergency services. In the rural group, the ambivalence brought on by economic pushes and pulls are often amplified on the reservation by threats of resource shortages, a long history of poor land-use and building construction methods, the geographic isolation of the reservation, social exclusion (Fothergill & Peek, 2004, p. 89) and continuous economic problems. These all intersect to create a perfect storm of vulnerability that would make any disaster event that much worse. Moreover, these factors can not only increase danger on the reservation and in the city, but can also serve to put off planning in lieu of other more pressing daily concerns.

**Intersectionality**

Intersectionality (Andersen, 2005) can be used to better view the interactions among different forms of marginalization in how they impact life’s chances and the economic ability to mitigate against potential disasters or to move from more hazardous locations. For example, social class, race/ethnicity and place (or space) also intersect with the worldviews of the interviewees. While many research participants I met on the reservation spoke of the poorly built houses, there was also usually a sense of frustration or ambivalence expressed by several people on the reservation because they have limited choices about where to live. Many live in the 20 year old cluster housing that several interviewees said were poorly made and poorly placed
all of which were completely dependent on electric lines for operating the functions of the household during the rural blizzard in early November 2008, and all of which failed in the face of the blizzard. However, the rural interviewees spoke of the cluster housing projects as one of the few affordable places to live that is within 30 miles of the local community. Although not directly addressed, all of the rural group, and most of the urban group, reside in households with low incomes, which often dictates where a person is able to live. Considering the large amount of hostility towards Native people just off the reservation, and the interaction of race/ethnicity with pervasively lower class incomes on the reservation, finding safe and suitable housing in order to ameliorate disaster risk seems unlikely. The structural and political intersectionality (Walby, Armstrong, & Strid, 2012) of socioeconomic disparity and inequality for those living on the reservation, and the range of hazards and vulnerabilities faced by groups (described in the results chapter), present a salient image of the dangers and hazards in the environments of both the rural and urban groups. These socio-economic challenges, memories and images likely influence risk perceptions and planning efforts, perhaps at least as much as experiencing time/space from an indigenous perspective and invoking the power of creating legitimacy by maintaining content and state merit in the forms of disaster planning process which tribal peoples undertake to keep themselves and others safe. Another aspect of worldviews that is influential in perceptions and social action involves culture and social change that has occurred for many American Indians who bridge a more American Indian worldview and that of the Western world.

A Foot in Two Worlds Revisited

One of the most interesting themes touched on in the results chapter was about how so
many of the American Indians interviewed reported experiencing a sense of “living in two worlds.” This is not all that uncommon. The literature states that some American Indians do report living in two worlds (Claudia & Curry, 1998). This provides a lot of ambiguity. Maintaining traditional American Indian ontology, cosmology and epistemology, while operating in the dominant Western culture seems a significant challenge. In this pseudo-assimilation, pragmatic concerns of attending to daily needs and activities have forced even the most isolated and traditional American Indians into the wage-earning, consumer driven, private property oriented, ways of modernity. Some flourish, navigating different ways of being, some do not. Some that operate across these boundaries are able to maintain two dissimilar cultural identities, comparable to being bilingual. However, this biculturalism does not necessarily represent ‘acculturation’ because this would involve learning a new culture (Western) while minimizing identification with the prior culture (American Indian). Instead this bicultural traveler maintains and utilizes both cultures (Sadao, 2003). This is evident in the lives of both Arlene (002) and her husband Kevin (012), the EMTs and first responders discussed above. Although both are very traditional and participate in the concrete and symbolic aspects of their culture, they also bridge over into the functions of modernity with ease; from working with various emergency management services at the tribal, state, regional, federal levels, Arlene and Kevin would have to be fluent in the language of code switching, “applying parts of their separate value systems to different situations as appropriate” (Sado, 2003: 410). In order to operate on the reservation as a first responders Arlene and Kevin (and others) reported having to work with Lakota peoples who did not speak English, much less have Western values and modes of living. Arlene and Kevin reported having to translate between the Lakota and the English languages and ways of being, thus code switching at will in order to bridge the cultural gap of
living in two worlds.

Many of the American Indians in this sample clearly have a foot in tribal tradition and in modernity. While it is commonly assumed that American Indians have lost their cultural identity through modernization, this notion has been contested. Many modernized American Indian tribes exist. For example, while the Indian casino business is well known, lesser-known examples such as the Wisconsin Menominee and Alaskan Tsimishian Tribes, have developed fishing industries while keeping much of their cultural worldview intact (Hosmer, 1999). This type of bicultural reach and social capital is noted how many of the participants who related ontological ideas, cosmological stories and accepted epistemological practices and ways of doing things. These phenomena looks both backward in time to a more essentialized idea of a traditional American Indian, and simultaneously forward in time. This forward thrust is noted in the research participants’ use of social media and other forms of modern communication. As seen in the results chapter, in both the rural and urban groups, most of the American Indians in the sample used the most modern technology and social media to stay connected to their social networks and to find out hazard and disaster information. For example, many of the interviewees talked about communicating about local and distant hazards using social media on the Internet, such as Facebook. All respondents reported having cell phones, on which they casually surf the internet and use these technologies to gather and confirm hazard information. Through an audiovisual medium, like Skype or cell phone technology, information about hazards can be effectively communicated. Technology has bridged, in its own way, the isolation of the more traditional people in both the rural and urban samples. Moreover, using modern technology not only links rural and urban Indians to the larger world in through a medium of
cyberspace, but may also serve as form of purposeful modernization that provides independence to move between worlds (Hosmer, 1999).

However, conflict is part of living in two worlds as well. Living in two-worlds, or being bicultural, may include various aspects of the American Indian worldview model constructed to explore risk perceptions and disaster planning, but also recognize many of the undeniable hegemony of the Western perspective. Some who reported living in two-worlds may not enthusiastically wish for more of the goods of progress and consumerism endemic to the western worldview, but several do recognize the institutional staying power of the Western worldview that extends its self through modernization, instrumental rationality, efficiency, a firm belief in “progress” and economic expansion (Fogel-Chance, 1993).

Some Indians are not necessarily trying to “pass” in order to participate in the dominant culture, but seek to become part of that world while holding on to their values; this may represent another hybridized adaptation of Native peoples through forced socio-economic assimilation, but not geographical, cultural and historical assimilation. Although this type of biculturalism may enhance cultural proficiency and provide the tools necessary to “live effectively, and in a satisfying manner within two groups without compromising one’s sense of cultural identity” (LaFromboise, Coleman, & Gertman, 1993) there are conflicts that arise from the American Indian Diaspora that traverses more traditional American Indian worldviews and the worldviews of modern, Western life. For example, some research participants reported they feel forced out of the traditional mode of life and into the modern, non-Indian world, and a worldview centered on obtaining money and accumulating wealth under the auspices of a free-market ideology and rugged individualism. Urbanization and participation in informal and formal economies have led to interesting mixes of traditional and modern life for several of the research participants, some
tied to cultural loss. For instance a few of the urban group talked about not being sure about the timing of some ceremonies because being away from the reservation, they had difficulty maintaining consistent elders and medicine people in the city. In another tack, one respondent in this study said she prefers assimilation into the “white ways” of the dominant culture. As noted in the results chapter, Lisa (004) does not want to actually operate in two worlds, but wishes not to let her tribal culture “destroy” her White world. Yet, spending time with Lisa and her extended family it was evident that she is greatly enmeshed in her Lakota culture. That said, there are several limitation to the study as a whole, as expected for exploratory pilot studies such as this.

Limitations of the Research

Limitations to this study include methods issues such as sample composition, sample size and field work processes. For instance, there was a rather large skew in the sample composition towards females; 75% of the study sample were women. Although the existence of gender bias in the social sciences, humanities and natural science research towards the detrimental inclusion of males over females has been long known (Eichler, Reisman, & Borins, 1992), this study resulted in the opposite situation in which the sampling bias was heavily skewed towards women. A detailed exploration and explanation of this skew is outside the purview of this research project. The reason for inclusion of more women in this study may be partly explained by the snowball method utilized in sample selection. The first interviews in both the rural and urban groups were with women, and at the end of each interview when asked about others who may be interested in doing an interview, the women in the sample often led me to a female family member or a close friend.
However, an amusing anecdote addressing this bias was told by Arlene, the rural EMT and first responder mentioned so frequently above. Arlene reported that nearly all those who have served on the ambulance squad over the years were women, which at times required scheduling changes as many of the women had their own families to care for and several had given birth over the years. Arlene also said that women tend to run most of the other interventions and programs on the reservation as well. When I asked Arlene why most leadership roles consisted of women on the reservation I almost followed up on her response as though it held content and state merit. Arlene responded that on the reservation, the men had become too weak to be leaders because they no longer consumed buffalo. Under the government umbrella of feeding almost all American Indian tribes with high fat, high sugar “commodities,” the traditional diet of buffalo meat was replaced with chicken. Arlene said due to the high consumption of chicken the Lakota males had become so weak they cannot be leaders. As I began to follow up on this comment, Arlene smiled wryly, seeing that I had fallen for her humorous story, she interrupted my query by bluntly saying, “hey, don’t focus on the chicken, I was joking.”

In addition, there may be limitations in conceptual terms as well. For example, there is admittedly a fair amount of ambiguity and overlap in how some themes were defined or operationalized. Also, using typologies, such as those constructed for the worldview framework, and the rural/urban division used in analysis, present limitations as well. The sample size for the entire study population was small. Only 28 individuals participated in the study, with 14 rural and 14 urban American Indians in each group. This small sample size and lack of random sampling makes it impossible to generalize the findings of the researcher to the larger populations of American Indians.
Other limitations involve conceptualization and the amount of time spent doing fieldwork. Concepts like worldviews and risk perception are difficult to elicit from interview participants. These phenomena are amorphous and difficult to express in the calm of an interview, unless the interviewee has recently enough experienced a disaster or unless they work in the field of disaster management. Rendering useful comparative data was also made more difficult by the short amount of time spent at each field site, rural and urban. It is important to spend enough time in the field to understand the complexities of how worldviews and risk perception play out in the naturalistic context in which people act and events occur. However, due to financial and time constraints, the limited amount of time spent in the field (total of 5 weeks) was not enough to obtain great depth towards understanding worldviews, risk perceptions and disaster planning from the emic perspective of the research participants. Worldviews and risk perceptions are not phenomena that most people frequently think about, much less verbalize, in an immediate way unless probed to do so. These phenomena are difficult subjects for research participants to broach; worldviews are axiomatically taken for granted concepts that are usually not usually reflected upon until a crisis happens. And risk is not the first and last thing most people think about during a given day. Even though the researcher spent several weeks on the northern plains in the rural and urban settings, in order to gain fuller insight into how American Indian worldviews influence risk perceptions for environmental hazards, longitudinal studies are needed. Researchers need to be in the field over long periods of time studying vagaries such as worldviews and risk, before, during and after hazard events in order to explore how individuals often act ambiguously by saying one thing, and doing another. Long term field work would permit researchers to not only know become immersed in the range of hazards, vulnerabilities,
and forms of resilience in Indian communities but would also allow them to access more hidden and veiled aspects of these amorphous phenomena.

Admittedly, there is also ambiguity in developing several of the themes in the worldview framework constructed for this study, which presents some limitations as well. The axes used were constructed from several indigenous and non-indigenous sources as a general sensitizing guide and framework through which perceived risk and planning could be explored. However, some of the concepts overlap and defy easy categorization. For example, the criteria used for coding the concepts of balance/imbalance in the third axis of the model, *way of explaining the world*, is interdependent upon and intermixed with, elements in Axis 5, *being in the world* in terms of holism.

In addition to the limitations above, there are also methodological limitations from bifurcating the study sample into rural and urban groups. While there was clearly a ‘rural’ group of participants in the sample who lived full time on a reservation in the northern plains, as noted above, many of the urban research participants in this study maintain their links to rural, reservation communities from which they and/or their parents and grandparents originally came. In addition to the communication technology and social media that blur social boundaries of rural and urban, many Indians living in two worlds blur the boundaries of identity.

The ambiguous boundaries of rural and urban have also been contested in sociology. Just as many American Indians have had to traverse two worlds in the rapid social changes that came with 20th century industrial and technological changes, many also frequently go between urban and rural settings. In social theory, the earliest sociologists framed the effects of industrialization in the rural-urban continuum; Tonnies, Marx, Durkheim, Simmel, Weber, all saw this distinction. The continuum is best exemplified in Tonnies’ *Gemeinschaft und Gesellschaft* and Durkheim’s
Mechanical verses *Organic Solidarity*. However, later scholars in the middle of the 20th century concluded that rural communities were so dependent upon national processes and urban centers that anything said about any rural group would be so incomplete as to not be significant (Stern & Wellman, 2010). While this may be a limitation, dividing the sample into rural and urban groups still provided heretofore lacking baseline data and entry into studying Indian worldviews, risk perceptions and disaster planning.

Moreover, the bifurcation of the study sample into rural and urban worked well in terms of how the snowball sampling procedures emerged under the methodological approaches of grounded theory. While I was unable to access to my original research sample because of a natural disaster that left them unavailable during the research period, the personal connections made with American Indians over the years eventually led me first to the reservation on the plains where I interviewed all the rural participants first. A couple weeks later the data from the urban sample was captured.

A final limitation undergirds construction of the indigenous worldview framework. Even though the framework was carefully constructed from reliable sources in the literature, there is an ever present caveat to developing such a tool to explore the lives of indigenous populations; such models are admittedly limited as constructs, and only to be used as an ideal type to be used for exploratory or for analytical purposes. In no way does the worldview framework entail all the complex factors that constitute an indigenous worldview. Such a model does not account for the cultural variation in views and perceptions within and between American Indian groups and individuals. Models like this should not be misconstrued as an attempt to essentialize the worldview of indigenous peoples in general, and “Indian-ness” in particular. It is not difficult for scholars and non-scholars alike to fall into the static moment of thinking American Indians
are homogenous and timeless—stuck in an idealized past; this is an old myth that is overly reproduced in just about any popular context that deals with anything “Indian.”

One theme that emerges when considering Indian-ness and the environment is the myth that all American Indians are ecological minded. While many of the research participants in this study did discuss ontological ideas about the purity of the environment and the sanctity of ‘Mother Nature,’ perspective in no way represents all American Indians. The mythology of the Noble Savage who lived in complete balance with the earth and never disturbed the environment is, just that, a myth. While it is true that where and how Indians live are tied to localized Indian-related issues (Peroff & Wildcat, 2002), the dominant culture in America has constructed a simulacrum of essentialized images of American Indians and their assumed relationship with the environment. Embedded in the cultural primers and popular constructions of American Indian-ness are static representations of how Indians ought to be, instead of how they actually may be. Public desire to “gaze upon and consume Nativeness” (Scarangella & Forte, 2010) in personal relations, as well as hegemonic institutions and media in the western hemisphere has a long history of Euro-American framing images of Indians in light of their own assumptions, perceptions and proclivities. Indian-ness has long been commodified and Americanized as a symbols of both the agrarian protest against the landlord government of the Old World and the ultimate break with England in the American Revolution, and the wilderness that embodies imagery common to ideals of American manifest destiny and pre-ordained westward expansion. In this process, many Americans have co-opted Indian-ness, from the Boston Tea Party “Indians” to the Tammany associations which institutionalized opposition to England, all used Indian identity to represent their causes. Indians have been cast as both insiders and outsiders, with double identities as both citizen-traitor at different points along the way (Deloria, 1998, p.
From the Tammany Paraders, Boston Tea Party Indians, the Society of Red Men, to Lewis Henry Morgan’s patriotic ideation of Indian-ness as a transcendent form, to the Camp Fire Girls and Grateful Dead Indians, many seeking to express support for American nationalism have gone clad in Indian garb to “express inexpressible cosmic truths …of the natural and proper places of men and women and the importance of authenticity in the modern world” (Deloria, 1998, p. 183).

This idealized authenticity of the ecological Indian motif is well represented in the environmentalist co-opting of static Indian identity in the Keep America Beautiful anti-pollution campaigns of the 1960s. In one commercial “Iron Eyes Cody,” an actor dressed as an Indian, paddles his birch bark canoe on water that becomes increasingly polluted. He is next seen beneath a highway underpass, when a bag of garbage splatters at his feet from a passing car overhead; a tear runs from the corner of each Indian eye. As Cody indicts modernity for environmental abuses, he sends a message that individuals alone are responsible for degrading the planet, rather than macro institutions within our social structure (Dunaway, 2008). In doing so he ensconces in the vivid imaginations of generations of consumers the image of Indian-ness as a past relic, one born of the nobility of the wild and of a pristine wilderness untouched by humanity.

However, indigenous peoples across the globe have always crossed cultural and physical boundaries easily, just as everybody else does. The essentialized gaze casting American Indians as Noble Savages, who were of a dignified conquered people, and equally noble protector of a pristine pre-Colombian environment, has been contested. The idea of a few ecologically minded small numbers of nomadic Indian tribes, roaming the Americas since travelling to the Americas via the Bearing Strait 12,000 years ago, is appealing and fits with the narrative of Europeans
moving into an original, pristine and unspoiled Garden of Eden with few inhabitants. Yet, research supports that the Americas were heavily populated and unimaginably diverse in their worldviews and their interaction with the environment. From burning vast tracts of land to control undergrowth in the forests of the northeastern U.S. and along the Atlantic seaboard area, to the vast alterations of the environment developing the great city of Tenochtitlan of the Aztecs and their seasonal flood control systems the Spanish called the desangue, to large pre-Colombian population centers in Amazonia, to some of the earliest genetic engineering in the breeding of the first maize through altering a mountain grass called teosinte along mountain side irrigation systems in South America, the Americas have been significantly landscaped by the sheaves of generations of Natives that have occupied the western hemisphere (Mann, 2005).

In order to understand how American Indians perceive risks it is critical to not be trapped in reductionist thinking that promotes thinking of Indians as homogenous. While it is clear that the Indians in the sample experience at least some of environmental hazards, risks and danger in much of the same the same ways as would anybody in their rural or urban context, they also present interesting frames for the interpretation of danger. Relying on an American Indian ontology in which one’s ethnic social location is not stable or static, or reified in a mythical image of Indian-ness, makes it difficult to categorize worldviews or perceptions as American Indian because “ethnicities are always contemporary constructs, and thus always changing” (Quijano & Wallerstein, 1992, p. 550). Thus, while constructing the worldview framework worked well as an opening exploratory tool to better understand American Indian worldviews, risk perceptions and disaster planning, it is limited as a realistic tool for understanding the research topic without using long term, longitudinal fieldwork in American Indian communities. The ideas discussed above, about images of the cultural other and essentialization of worldviews
and Indians, figures heavily into the implication and future direction research such as this should take.

Implications and Future Directions

From the above, it was clear that many more in the rural part of the sample reported having disaster kits on hand, knowing evacuation routes and making contingency plans for potential disasters. Although the indigenous worldview framework may not be the best tool for studying risk perceptions or disaster planning, it provided some other valuable insights into these phenomena, as noted in the results chapter above. However, one of the most interesting themes to emerge that has not been mentioned is the responsiveness of the sample to talking about disaster planning. A couple of the rural interviewees and several of the urban interviewees who did not report doing disaster planning in their home, responded that the interview process itself, which sometimes served as a stimulus to begin making some type of a disaster kit in their homes. This intervention aspect of interviewing was seen at an institutional level during one of the urban interviews as well. For instance, when asking Episcopalian Lakota Minister “Blizzard” Bill (022) if Episcopalian churches like his could be used as interconnected places or like nodes of material and non-material support in the event of a disaster, he replied, “yeah, yeah. It could definitely be. I think churches can do that because most church building across the country are under-utilized space.” Pamela (020), one of the several co-founders of the American Indian Movement and long time community organizer, and founder of the Indian medical clinic and disaster triage group, mentioned elsewhere, also suggested that the urban intertribal center could serve in some capacity in a community planning and response effort. This responsiveness points to an implication of this research for the future directions this line of research may be able to
take. When individuals and representatives of iconic religious and cultural institutions express an interest in community level disaster planning and awareness, perhaps the time is right for making larger research agendas in Indian country, but only in concert with American Indians. American Indian collaborations and recent legislative shifts have made possible the idealistic notion of doing truly participatory collaborative research has never been better, at least to the degree that non-Indian researchers operate under the framework of cultural humility and allow Indian researchers to teach and lead them in such endeavors.

The future directions that this research should take are already underway. In 2011 Presidential Policy Directive (PPD-8) directed the Homeland Security department to fulfill the National Preparedness Goal of identifying the most significant hazards that threaten the nation and the core capabilities in place to address such environmental threats (U.S. Department of Homeland Security, 2011). In tandem with, and in response to this goal, efforts should be put towards community level research in Indian country. As this study reflects and as the literature reports, household level research in disaster planning is available and fairly straightforward (Tierney et al., 2007; Phillips & Morrow, 2007), and this unit of analysis has received much more attention than has research that advances what we know about whole communities (Simpson, 2008). Since American Indians have for so long been ignored in hazards and disaster research (Shriver & Webb, 2009), this call for whole community research is timely. In the past two years inroads have been made by the researcher to collaborate with a national American Indian disaster preparedness and response group called the “indigenous Tribal Emergency Management Association (iTEMA). Their goals, as well as the long term goal of the researcher, are to better understand disaster planning at the community level and to explore different efforts and challenges doing disaster planning and preparedness across the multi-cultural range of
American Indian communities and tribes. With interconnections being made into Indian country and the reach of groups like iTEMA, disaster planning and preparedness levels can be estimated from heretofore unreachable tribal groups, providing researchers have the correct relationship with tribal members or an insider to champion their cause.

One thing is certain though, if in roads into disaster planning in Indian country are to be made in collaboration with tribal peoples, the above discussion on essentializing Indian-ness is that much more relevant and a serious consideration of this study. Moreover, the need to understand “Indian-ness” speaks volumes about building relationships in Indian country that are strong enough to endure the rigors and demands of truly cross-cultural, collaborative work.

Unless we really begin to think of American Indian identity as dynamic, as changing people responding to the demands of the social and cultural conditions in an always changing environment, essentialization is always a waiting pitfall. In this, the great diversity across and between American Indian peoples is easily lost in bureaucratic institutions of emergency management and FEMA. This seems exceptionally relevant to the rural tribal group in the study. Some research suggests that in addition to living in economic marginality, unincorporated, rural areas are often ignored in the politically-charged environs of disaster management (Morrow, 1999). Whether rural or urban, many politically marginalized or disenfranchised American Indian groups are not only joining together and organizing around disaster management issues, but are also working with inter-tribal and non-Indian advocacy organizations. These are critical support for planning for, responding to and recovering from hazard events (Dash et al., 1997). In these endeavors, to ensure the safety of Native peoples from environmental hazards there is likely to be much cultural cross-over. There will be numerous different tribal groups within and across Indian country, and numerous non-Indian groups who will necessarily have to cross
cultural boundaries in order to obtain the necessary data on which mitigation in Indian country can build to do planning in American Indian communities in a useful and broad way. Given the high number of research participants in this study who report living in two-worlds, being able to unpack worldviews, risk perceptions and disaster planning across Indian country will rely somewhat on the bicultural and the liminal American Indians who can help guide outsider researchers who seek to be part of the collaborative process of disaster research in Indian country.
APPENDIX

CONSENT FORM
Title of Study
An American Indian Worldview, Risk Perceptions and Disasters: Exploring an indigenous Perspective

Principal Investigator of Dissertation Project:
Rodney A. Bales, Doctoral Candidate

Principle Investigator UNT Sponsor
Dr. Nicole Dash

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Purpose of the Study
The purpose of this study is to understand your worldview and perceptions of risk related to man-made and natural disasters.

Description of the Study
This study will explore American Indians perceptions of risk and danger associated with man-made and natural disasters. This is important because big government agencies like FEMA (Federal Emergency Management Agency) sometimes mistakenly assume all people will behave the same when warned of disasters. However, agencies like FEMA often base their strategies on information gathered from mainstream groups of people, and they know little about how groups like American Indians think about risk related to disasters. So the goal of the research project to better understand how American Indians see risk and danger so that Indian and non-Indian disaster planners can make better disaster plans that include the perspectives of American Indian Peoples.

Procedures to be used
If you choose to be in the study, you will be interviewed for about 30 to 60 minutes and asked questions about your perceptions of the world in general, as well as your knowledge and experiences related to disasters. The interview will be audio-recorded and transcribed into a written format by the researcher. Research generated from this study may be presented at professional meetings and conferences. Additionally, the research findings may be incorporated into submissions to scholarly and peer-reviewed journals for publication and dissemination into the larger body of scholarship in the social sciences. If you agree to participate in this study you will be given a $25 gift card from a local merchant/store to compensate you for your time spent doing the interview. You will receive the gift card at the end of the interview. Should you decide to end the interview before answering all of the interview questions you will receive partial payment for completing some of the interview.

Information that will be used or disclosed/ Procedures for maintaining confidentiality
Your name will not be in any reports that result from this study. All identifying information will be coded so that no one except the researcher will know your identity. Recordings of the interview process will be anonymous, with a code kept only by the Project Investigator. Any personal information about you that is collected will stay private to the fullest extent possible by law.

Description of the foreseeable risks
It is very unlikely taking part in this study will cause harm. Although not the goal of the study, you may inadvertently discuss potentially sensitive or personal information, which could be upsetting to you. However, you may choose to stop being a part of our interview at any time. The interviewer has special training to help people talk about very personal things and will try to help all study participants feel at ease.
Benefits to the subjects or others
You may not benefit directly from being in this study. However, you are contributing to theoretical contributions to the study of disasters in the larger academic community. You may also come to a deeper understanding of the complex processes that involve worldviews, risk perceptions and disaster management in your local community.

Review for the Protection of Participants
You may ask questions at any time by contacting the UNT Sociology department at (940) 565-2296. Rodney A. Bales, MS is the Principle Investigator.

This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Subject's Rights
I have read or have had read to me all of the above. The researcher has explained the study to me and answered all of my questions. I have been told the risks and/or discomforts as well as the possible benefits of the study.

I understand my rights as a research subject and I voluntarily consent to participate in this study. I understand what the study is about, how the study is conducted, and why it is being performed. I have been told I will be offered a signed copy of this consent form.

_______________________________________  _____________
Signature of Subject            Date

For the Investigator:
I certify that I have reviewed the contents of this form with the subject signing above. I have explained the known benefits and risks of the research. It is my opinion that the subject understood the explanation.

_______________________________________  _____________
Signature of Principal Investigator       Date
REFERENCES


