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FRAGMENTARY WORLDS: UNNATURAL PERCEPTIONS
OF AND RESPONSES TO SEVERE WEATHER BY PEOPLE WITH
SENSORY/MOBILITY IMPAIRMENTS

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By

TODD J. REYNOLDS

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FRAGMENTARY WORLDS? – SENSORY/MOBILITY IMPAIRMENT:
INDISTINGUISHABLE PERCEPTIONS AND SHADOWY RESPONSES TO
SEVERE WEATHER

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF GEOGRAPHY

BY

Fred Shelley, Chair

Andrew Wood

Betty Harris

Richard Nostrand

Karl Offen

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Table of Contents

1. INTRODUCTION	1
1.1 Genesis of the Dissertation	1
1.2 What is a Radical or Unnatural Hazard?	2
1.3 Study Area and Justification of Dissertation	5
1.4 Statement of Purpose and Significance	6
1.5 Research Hypothesis	7
1.6 Structure of the Dissertation	7
2. BACKGROUND	9
2.1 Introduction	9
2.2 Accessibility and Mobility Issues	10
2.3 Service Provision	18
2.4 Production of Difference	33
2.5 Personal Experiences	47
2.6 Summary of Disability Literature	57
2.7 Hazards and Disability	58
2.8 Bringing the Literature Together	75
2.8.1 Accessibility and Mobility Issues	76
2.8.2 Service Provision	77
2.8.3 Production of Difference	77
2.8.4 Personal Experiences	77
3. RESEARCH PROBLEM AND METHODOLOGY	79
4. ANALYSIS AND DISCUSSION	91

5. CONCLUSION	110
REFERENCES CITED	115
APPENDIX	129
PERSONAL VITAE	130

List of Tables

Table 3.1 Participant Profile.....86

Abstract

This study is the first to investigate how people with disabilities perceive and respond to severe weather alerts. Their unfortunate experiences, underscored by the Indian Ocean monster tsunami in 2004 and hurricane Katrina in 2005 reinforced the need to further understand the manner in which people with sensory/physical impairments perceive and respond to severe weather warnings. In this dissertation I argue that people with sensory/physical impairments often demonstrate an unnatural quality to ‘natural’ hazards in their approach and behavior to severe weather. In order to achieve this objective I use a methodology first developed and implemented by Zimmerman and Wieder (1977), the Diary: Diary-Interview Method, to examine these unnatural personal experiences of 5 research subjects with diverse sensory and physical impairments, between the ages of 24 and 60, during the Spring and Summer months of 2005 and 2006. These experiences are then compared to the experiences of a able-bodied control group. Analysis of the data reveals that a lack of social capital suggests an unnatural hazards component when severe weather events threaten. However, participants with access to social capital exhibit a commonalty with able-bodied participants and demonstrate natural circumstances when dealing with severe weather events. Following this evidence, I conclude from the results of the research that social capital is a necessity for people with sensory and/or physical impairments, and this evidence should be accounted for when considering the theory of unnatural hazards.

Key words: people with sensory/physical disabilities, natural/unnatural hazards, personal experiences.

1. INTRODUCTION

We inhabit 'One Earth' whose physical systems are interdependent, but we also live in 'Many Worlds' that are fragmented into competitive groups by divisions of religion, class, language, ethnicity, and historical experiences. It is evident that hazards must be considered in the context of several hierarchical spatial mosaics of socio-economic conditions (Mitchell, 1989, 419).

1.1 Genesis of the Dissertation

There is a need to further awareness of how people with disabilities perceive and respond to severe weather events. Accordingly the objective of this research was to shed light on the relationship between people with physical/sensory impairments and severe weather warnings and the events that follow. The primary research objective was to understand how individuals with these types of disabilities become aware of and respond to the threat of and the effects of severe weather events.

My work as a master's degree student began in the physical geography realm with a focus on hydrology, but soon gradually shifted to water resources and environmental management. This led me to an interest in environmental justice. I came to the University of Oklahoma (OU) with the intent of getting my doctorate with a focus in environmental justice, but after a year of research in that area, I decided that I wanted to pursue something more 'pristine' and untouched. Another perspective for viewing natural hazards appealed to me, a more disproportionate impact on certain social groups. It was called *Radical or unnatural Hazards* research and involved fundamental and unorthodox causes of natural hazards. Radical or unnatural in this sense means interpretations that propose to deal with fundamental issues such as human rights and the links among disasters, economic development, and politics (Wisner and Fordham's

RADIX website, 2001). My interest grew upon learning about this phenomenon, and I then set out to read about radical or unnatural hazards.

1.2 What is a Radical or Unnatural Hazard?

A radical concept in regards to natural hazards struck an interest in me, and I wondered how natural hazards could indeed be unnatural. As I read through the literature, the idea began to crystallize. O’Keefe et al. (1976) argue that natural disasters are more a consequence of socio-economic than natural factors, and that “without people there is no disaster” (p. 567). More to the point, natural hazards are actually the *interface* of extreme atmospheric events and human vulnerability. Likewise, Blaikie et al. (1994) argue that disasters are not merely caused by natural events, but are also the product of social, political, and economic processes, and the direct influence these circumstances have on people. Researchers developing this concept at that time coined the term “unnatural hazards” in recognition of the interface between human activity and natural processes.

Vulnerability is a fundamental concept when discussing unnatural hazards. Vulnerability is defined by Susman et al. (1983) as the degree to which different social groups are differentially at risk. Similarly, Blaikie et al. (1994) refines the definition of vulnerability to mean “the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard.” The presence of society is becoming evident here, as these references all seem to be hinting at more than physical meteorological events as the sole causes of natural hazards. Wisner and Luce (1993) provide additional evidence that the expression “vulnerable” has been used quite frequently beginning in the 1980s in hazards scholarship. One of these

circumstances is “social vulnerability.” This means that certain social groups, defined on the basis of factors such as race, religious beliefs, or ethnicity, can be especially vulnerable to hazards.

Emel and Peet (1989) suggested that bureaucratic rationalization, complexity, and society’s increasing reliance on technology cause an increase in vulnerability. In doing so, Emel and Peet argued that natural hazards should be dealt with in socio-economic terms, such as establishing social capital and avoid locating living areas in hazard-prone areas like floodplains, rather than by using technology in an attempt to control nature. According to Emel and Peet, this reliance on technology would initiate social, cultural, and political chaos (as upheaval). Another situation with respect to vulnerability arises when one considers the geographical concept of spatial scale. The concept of vulnerability is sometimes used to characterize cities on the basis of safety (Sin and Davies, 1991). Sin and Davies argue that poor urban development on hazardous locations is too often given priority over human life. For example, New Orleans was built on a floodplain close to the Gulf of Mexico, in a hurricane-prone area. Colten (2005) discusses the social implications resulting from hurricanes striking this heavily populated city. Hurricane Katrina in August 2005 demonstrated the extreme vulnerability of New Orleans.

Vulnerability is also associated with the ability to protect oneself, and to recover to daily life after the hazard. Social networks help people to protect themselves in the event of disaster. Cutter et al. (2000) note how social attributes such as affluence and/or housing characteristics like proximity to the potential source define the un-naturalness of meteorological hazards. Cutter et al. go on to describe special-needs populations as those

requiring careful consideration in the event of hazards and emergency response. Furthermore, Blaikie et al. (1994) describe “weak” individuals as those who are more prone than others to experiencing life-altering circumstances, damage, loss, and suffering in a hazard event. Likewise, “weak” social groups face an increased vulnerability to extreme natural events because of lack of access to resources and misdirected mitigation efforts. According to Blaikie et al. (1994), special needs populations include the elderly, the very young, certain ethnic minorities of any age, the poor, the disempowered, women, and the disabled. Emergency planning must include strategies to include special-needs people.

I believe that the concept of the un-naturalness of hazards, which was well documented during the late 1970s through the 1980s, should continue. The RADIX website <http://www.radixonline.org/> seeks to do just that by collecting various writings from a plethora of disciplines. In fact, there is currently an ongoing debate surrounding the un-natural causes and effects following Hurricane Katrina, which smashed into the United States Gulf of Mexico coastline in late August of 2005 (RADIX website, 2005). I wish to contribute to the awareness of the un-naturalness of hazards by writing from a geographical perspective about a poorly documented social group that is in dire need of recognition. There is a strong need for additional writing on the vulnerability of special needs populations who are dealing with hazards.

Severe weather events can have especially significant impacts on vulnerable populations (Aquino and Zapata, 2006). Individuals with special needs are vulnerable in part because their requirements in relation to severe weather events can differ considerably from those of the general population. Difficulties associated with the

receipt of warnings are especially acute in the case of the vision-and hearing-impaired. Those with mobility-related disabilities face potential difficulties pertaining to evacuation or other appropriate evasive actions in response to warnings and weather events. Yet the experiences of individuals with disabilities with significant weather events, and especially the individual geographies through which individuals are made vulnerable and safe, have received little academic attention.

1.3 Study Area and Justification of Dissertation

Norman, Oklahoma, located in Cleveland County, is home to a reasonably-sized disabled population (see Appendix for a definition of what determines a disability). Norman is located in an area that is particularly prone to significant weather events. On May 3, 1999, an F-5 tornado passed through the northern part of the county. One of the largest and most destructive tornados on record, the storm resulted in a total of forty-four fatalities and destroyed or damaged over 8,000 homes in Cleveland and neighboring Oklahoma Counties. While the May 3rd tornado was unusual in its severity, the state is particularly susceptible to storms and other “weather events.” From 1982 through 2004, the National Climatic Data Center registered 424 “weather events” in Cleveland County (National Climatic Data Center website, 1992-2005). This total includes 18 tornadoes resulting in 11 fatalities and 339 injuries plus an additional 159 thunderstorms and high wind events.

Such circumstances are not unusual in a country where weather-related natural hazards are relatively commonplace. Indeed, Steinberg (2000) notes the particular propensity of the United States to severe weather events. Therefore, the purpose of this research is to contribute to the geographical understanding of the experiences of those

with sensory and/or mobility disabilities in a context in which a disadvantaged social group is clearly at risk.

1.4 Statement of Purpose and Significance

This study is the FIRST to investigate how people with disabilities perceive and react to severe weather. Accordingly, this dissertation examines the relationship between disabled individuals and severe weather warnings and events. It examines the personal experiences of disabled individuals in Norman, Oklahoma in addressing the threat of and response to severe weather events. The relationship between vulnerable people and severe weather has been investigated from several perspectives, including engineering (Rahimi, 1993), history (Steinberg, 2000), sociology (Klinenberg, 2002), meteorology (Wood and Weisman, 2002, 2003), and policy (California Governor's Office of Emergency Services, 2000). Geographers (for example, Golledge, 1993, 1997; Dorn, 1994; Gleeson, 1997, 1999, 2001; Vujakovic and Matthews, 1994; Dear et al., 1997; Chouinard, 1997; Dyck, 1999; Parr and Butler, 1999; Kitchin and Law, 2001; Imrie, 1996, 1999, 2000, 2001) have examined several problems of concern to disabled populations, but none have investigated the relationship between those with disabilities and severe weather. Therefore, this project will contribute to the geographies of disabilities literature by providing research on the unique perception of people with disabilities and weather events.

The methodological approach that I use in this dissertation expands on the existing geography of disability due to the limited amount of work on disability and natural hazards. Qualitative methods in human geography have been discussed extensively (Eyles and Smith, 1988; Morgan, 1997; Elwood and Martin, 2000; Latham, 2003), but

few have applied these methods to disabled people and natural hazards. I am aware of none that have linked disability to severe weather. This research will use Zimmerman and Wieder's (1977) The Diary: Diary-Interview Method to examine the personal experiences of people with disabilities when severe weather threatens. The strength and clarity of the Zimmerman and Wieder method for investigating the personal experiences of social groups has been documented repeatedly in the literature (Seidman, 1991; Meth, 2003; and Latham, 2003).

1.5 Research Hypothesis

This project argues for the necessity to increase awareness of people with disabilities' special needs during severe weather events. Currently, personal experiences of people with sensory/physical impairments are parallel to radical or unnatural. I expected that my research subjects would demonstrate that they tend to be more capable of protecting themselves than typically supposed. Therefore, my research hypothesis is that, adaptive strategies of people with sensory-impairments and people with mobility-impairment are wholly a function of their impairment

1.6 Structure of the Dissertation

The dissertation consists of five chapters including this introduction. Chapter 2 reviews issues relevant to disability geography focusing first on the geographies of disability and then briefly on unnatural hazards. Unnatural circumstances related to the corporeality of impairments dictate conditions that make disabled persons more vulnerable to these hazards than the mainstream population. The issues in the geographies of disability literature describe these circumstances. The point here is to use

natural hazards to talk about disabilities. In addition, the four streams (below) will be expanded to include hazards. Here we look at how each of the circumstances outlined in Chapter 2 demonstrate scenarios that show how each can be developed into an natural hazards context.

Gleeson (2001) states there are four sub-streams within the disability literature. The first two situations, accessibility and mobility, and service provision, represent traditional approaches to work on the geography of disability. The remaining two issues, the production of difference, and personal experiences, represent more contemporary issues. A common theme in accessibility and mobility writing is the argument that construction of urban landscapes result in the exclusion of people with impairments. Issues concerning service provision involve dependent populations and the facilities designed to assist them. Meanwhile in more recent times, the production of difference examines the social oppression of people with impairments in a socio-spatial context, and personal experiences interprets the everyday life experiences of people with impairments, often focusing on certain life activities such as employment or social life.

Chapter 3 examines the research problem and methodology in more detail. The research problems are outlined and a description of how they contribute to gaps in the disability literature is given. Accordingly, the research problem examines personal experiences of people with sensory and/or mobility impairments when severe weather threatens. In order to achieve this objective in its entirety, it is necessary to approach the objective by pursuing it from several directions. Concurrently, the research questions contribute to filling a number of gaps in the geographical literature on disability. Accordingly, the primary research question asks how individuals with sensory

impairments perceive alerts, and how individuals with mobility impairments respond to evacuation needs. In Chapter 4 the analysis of the data collected is presented. Each individual interview and diary entry is followed with a discussion and whether vulnerability (difference) was indicated. Commonalties were also pointed out, indicating parallels with able-bodied participants. Accordingly, the analysis revealed that disabled participants with access to social capital displayed personal experiences similar to those of able-bodied participants. Concomitantly, social networks were the deciding element in how vulnerable one is. In Chapter 5, I discuss my conclusions. Questions and problems pertaining to this research topic that might present future study areas are given.

2. BACKGROUND

2.1 Introduction

The unnatural hazards literature describes the unnatural characteristics of hazards, but the geographies of disability literature lacks documentation of links between natural hazards and impairment. Therefore, my research uses natural hazards to investigate hazards and disability. In the Analysis and Discussion section the data are analyzed to assess how people with sensory disabilities perceive severe weather threats given lack of assistive technologies that improve access to alerts, and how people with physical impairments respond to severe weather threats despite inaccessible storm shelters.

Gleeson (2001) identifies four sub-streams of disability literature. These include (a) accessibility and mobility issues, (b) service provision, (c) production of difference, and (d) personal experiences. Accessibility and mobility issues and service provision represent traditional approaches to work on the geography of disability. Gleeson then examines contemporary issues that produce and reinforce difference, such as emphasizing differences instead of like qualities among people. He then discusses the personal experiences that describe the negotiation of the environment despite impairment. Driedger et al. (2004) elaborate on Gleeson's structure and view the geographical approach to disability as evolving from early interest in the accessibility of built landscapes to contemporary interests in social theory oriented studies in life experiences of people with disabilities.

2.2 Accessibility and Mobility Issues

Accessibility and mobility are critical considerations in understanding the impacts of impairment. Accessibility is determined by three factors: the spatial distribution of potential destinations; the ease of reaching each destination; and the magnitude, quality, and character of the activities found there (Handy and Niemeir, 1997). A common theme in accessibility and mobility issues is the observation that the construction of urban landscapes often results in the exclusion of people with disabilities. For example, poorly maintained sidewalks impede negotiation by mobility-impaired people. Another perspective would be that the poorly maintained sidewalk subjugates people with mobility-impairment.

Imrie (1999) addresses similar issues, but offers a rather different view of exclusion. Imrie argues that people with impairments are excluded not only because they may lack access to public spheres, but also because their voices go unheard when advocating barrier-free urban landscapes. He notes due to the increase in people with special needs in the planning and design process, that groups advocating barrier-free landscapes have limited potential to influence policymakers in the structure of built environments. This point supports the arguments made by Vujakovic and Matthews (2001) and Gleeson (2001).

The argument that people with impairments are excluded in the way that urban landscapes are constructed by government policies, is often supplemented by a concern with disability issues and human rights. Accordingly, Kitchin and Law (2001) develop a human rights framework to provide a critical analysis of the constraints on spatial behavior imposed by the socio-spatial construction of built environments on people who use mobility aids. While not criticizing city planners or urban designers per se, this

critique is another way of arguing that the attitudes and thoughts of social space violate the human rights of people with impairments.

There is evidence from outside North America of efforts to include people with impairments in the built environment. Edwards (2001) argues, however, that British government policy directed at combating social exclusion and inequality to enhance opportunities for disadvantaged social groups in Britain's urban areas actually fails to acknowledge the 'multidimensionality' and diversity of impairment in social space. Edwards argues that this policy has been unsuccessful because it attempts to use a single framework to satisfy every group's needs. The notion of the diversity of impairments that underlies Edwards' argument is common to work within the 'new medical geography'. As I outline shortly, the 'new medical geography' provides a useful framework for thinking about impairment and severe weather events.

Neumann and Uhlenkueken (2001) view technological innovations as fundamental in contributing to barrier-free landscapes in Germany. They see the possibilities of an increasing awareness for those with sensory¹ disabilities in terms of knowledge and communications. Despite problematic legal and institutional obstacles, Neumann and Uhlenkueken view assistive technologies as having powerful abilities in this respect.

An example shows that not all results of disability studies should be taken for granted. Golledge et al. (1999) recount the findings of a project which studied the ability of people with a variety of vision impairments to learn a complex route through an urban neighborhood. Participants from two separate locations were asked to learn a new route

¹ Sensory disabilities are separate from physical and mental disabilities. The U.S. Census Bureau, Census 2000 reports people 5 years old and older are considered to have a sensory disability if they report one or more of the following long-lasting conditions: blindness, deafness, or severe vision or hearing impairment. Sensory disabilities are important to this study because they impede perception of severe weather warnings.

over four trials in unfamiliar surroundings. On the first trial, each individual was guided but not led through the route and a named landmark stood on each section of the route end. Participants were asked to remember each landmark and directional guidance was indirect (e.g. “You need to turn to face my voice”). After completing the first trial, the vision-impaired participants were driven back to the starting point via a path that varied after each trial, and sighted participants were blindfolded along the way. On three subsequent trials, participants were asked to complete four specific navigation assignments. Incorporating the performance of each participant with respect to each assignment, Golledge et al. concluded that lack of vision does not necessarily affect the rate of spatial knowledge acquisition in real-world environments, that people with profound vision loss are capable of learning a complex route through an urban landscape both quickly and efficiently, and that their spatial awareness is comparable to those with adequate vision. These conclusions are in contrast to previous studies which indicate people with profound vision impairments experience a different world from those with adequate vision (Golledge, 1993). These results suggest that the spatial competence of vision impaired and blind people may have been underestimated. Golledge et al. noted the implications regarding such underestimates and quality of life for those with profound vision loss, notably suggestions that their present orientation and mobility training has led to overly restricted mobility patterns, thus such training needs to be reassessed.

Accessibility and mobility issues also affect residential realms and dimensions. Many individual residences are inaccessible to people with mobility impairments. According to Hahn (2003), many people with physical and/or sensory disabilities live in homes with no accessible accommodations permitting them to leave their own bedrooms, and just one

exit from the home itself. Hahn's evidence supports the findings in this dissertation, notably that mobility impairment hinders evacuation efforts.

Accessibility literature also considers measuring accessibility for people with differing abilities. Church and Marston (2003) criticize traditional measures of accessibility in that they fail to account for structural barriers and individual mobility limitations. In response, Church and Marston suggest a new point of view for measuring accessibility with a focus on people with differing abilities. Furthermore, Church and Marston argue that the absolute access measures for people with physical disabilities should be accompanied by the use of relative access measurement, taking into consideration landscape surfaces, barriers, and travel styles, to account for the flaws in traditional measurements of accessibility, notably absolute access measurements.

Church and Marston (2003) define absolute accessibility as a minimum required number of access routes are installed within a facility or building, usually just an entrance/exit from the street and from passenger boarding zones. Compliance with the Americans with Disabilities Act (ADA) is measured for absolute accessibility or is standards-based (Church and Marston, 2003). However, accessibility to certain other elements such as telephones, drinking fountains, and/or toilet facilities is *not* provided. In contrast, relative access recognizes the sensitivity, value, and quality of multiple access routes and accessibility to specific components such as telephones, and toilet facilities (Church and Marston, 2003). Thus, the differences in access relative to the differing corporealities of individual users are taken into account. As well, relative access aids in understanding the extra effort taken by individuals with disabilities in navigating built environments which are full of obstacles. The concept of relative access also provides a

good measure of understanding impacts of different design alternatives in buildings and public spaces.

Church and Marston's relative access suggestions are taken very seriously by Federal courts, as the Americans with Disabilities Act has been upheld in selected issues favoring relative accessibility. The Volume 14, Number 1, 2005 issue of the ADA Pipeline lists individual ADA activities of the Department of Justice, where relative access in the form of Litigation, Decisions, Consent Decrees, Formal Settlement Agreements, other agreements, or Mediation (ADA Pipeline, 2005). As a result, relative accessibility becomes visible and enhances the human rights of people with physical disabilities.

The Justice Department is becoming even more active in its support of disability rights and relative accessibility. Accordingly, the Department announced in October, 2005 that a claim made by the U.S. government, acting through the Civil Rights Division, had been settled. Likewise, the allegation claimed that a retirement community in Bucks County Pennsylvania, restricted residents' use of motorized mobility aids within its complex (Department of Justice, 2005b) and in doing so, produced disability-related housing discrimination. The ruling demonstrates that people with impairments living in retirement communities do not lose the protection of the Fair Housing Act, which makes it illegal to discriminate in housing sales or rentals or in housing lending and insurance on the basis of race, color, national origin, familial status, disability, sex, and religion (Fair Housing Act website, 2005), and more specifically is the section taken from the ADA Reference Book, which reads

The Americans with Disabilities (ADA) Act states its purpose as providing "a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities." The ADA Act guarantees disabled people access to employment, public accommodations, transportation, public services and telecommunications (Americans with Disabilities Reference Book, (2005).

Accordingly, the restrictions posed by the retirement community of interest threatened residents' independence in such a way that it encroached on their human rights.

Concurrently, legal action is justified.

Relative accessibility has been demanded in other forms as well. For example, Hahn (2003) discusses the demands made for disability measurements in the environmental and corporeal assessments context. Hahn goes on to reflect on the interaction between people with impairments and their surroundings. Hahn shows how the personal experiences of people with impairments are affected in their ability to seek service provision. These demands are being met slowly but surely. Notable are the projects being developed in Rehabilitation Science and Engineering that take into account environmental obstacles and barriers (Institute of Medicine, 1997). Examples are a project to investigate the role of community-based mitigation strategies during an influenza pandemic, and developing biomarker-based tools for cancer screening and treatment. These situations are significant in the fight for the implementation of relative accessibility.

Hahn (2003) uses techniques different from typical qualitative disability studies. In order to investigate barriers to health-promoting activities, Hahn employs a Geographic Information System (GIS) approach that overcomes earlier problems associated with Health Science research. Also noted as problematical is the choice between biomedical or social definitions of disability. This means basing treatment on a person's medical diagnosis as opposed to making social changes to cure one's impairment.

Golledge (2005) addresses geography's need to account for questions about how to achieve the goals of the Americans with Disabilities Act (ADA), including goals such as equal opportunity; equal environmental accessibility; and equal educational

opportunities. Acknowledging vision and visualization's importance to geography, Golledge focuses on those who are visually-impaired. He explores a wide variety of recent or soon-to-be available developments that serve to increase accessibility to and for learning geospatial information. These include technological instruments using senses other than sight to study and experience diverse environments, as well as environments beyond the range of our normal senses and their attributes. Golledge elaborates on several of these devices that make up additions to flat maps and are accessible to vision impaired geographers and students of geography. For example, three-dimensional representations, also known as tactile maps and models, incorporate geospatial information and allow people without sight to cognitively experience geographical concepts. Auditory maps allow those without sight to learn by touch and exploration not only physical landscapes like mountains and rivers but also concepts invisible to even sighted people, such as associations between countries and regions, and culture regions. According to Golledge, tactile maps are accessible, inexpensive, and a timely means for people without sight to experience geospatial phenomena.

Auditory maps have the potential to reveal important geospatial information using sound. Golledge (2005) relates how the use of changes in sound pitch and/or tone replaces the scale bars of conventional cartographic flat maps to correspond to active geographic characteristics such as temperature and rainfall amounts. Likewise, the procedure for developing the ideal auditory map is to spatially associate map locations with place-specific auditory meanings. However, how do we accommodate those people who are disadvantaged visually *and* hearing-impaired? Golledge addresses this question by describing a combination of tactile and sound-based alternatives to traditional flat

cartographic representations known as haptic maps or ‘soundscapes.’ After clearly describing the techniques and materials involved in the construction of these touch-and-sound-based information systems, the author relates their potential in the educational domain.

People often refer to spaces and places as ‘there’ or ‘here’ or other vague representations without distinguishing specific locations. Golledge (2005) elaborates on the use of spatial language that cannot be understood by those with vision difficulties to describe and interpret spatial phenomena. Because speech is often burdened with place and space representations in the form of adjectives, prepositions and nouns, understandable and interpretable geospatial information is accessible when absolute values are stated. Unless precise spatial language is given, persons with vision difficulties may find real-world environments difficult at best to access. Therefore, it is fundamental that geographic and language education be strict in accessible speech.

Golledge (2005) concludes by rearticulating geography’s domain of sighted individuals by emphasizing how the academic discipline has adapted to include individuals with visual impairments. The development of devices that employ senses other than vision offers much potential in providing learning opportunities for non-sighted persons. In addition, the author stresses the likelihood of sound via eloquently spoken spatial language becoming fundamental in the understanding and the interpretation of geospatial information by the visually impaired, and so geographers must perform research in this area as well.

2.3 Service Provision

While the literature on accessibility issues tends to deal with exclusion, the service provision literature focuses on dependent populations and the facilities designed to assist them. Deinstitutionalization is a common theme in this literature. Deinstitutionalization describes the process of discharging disabled people and other institutionalized people from large scale institutions into community-based care networks. Community-based care networks exist in several forms, including centers for independent living, halfway homes, and other community-based and empowering organizations providing formerly institutionalized individuals access to society.

Dear and Wolch's (1987) pioneering text describes the trials and tribulations of this process and links disabled people with other marginalized social groups in the deinstitutionalization program. Along with Park and Radford (1997), Dear and Wolch document the exclusion and isolation common to segregated people in large-scale institutions like asylums, hospitals, and correctional facilities. These exclusionary principles parallel those discussed in the accessibility and mobility literature. Dear and Wolch identify deinstitutionalization as the movement of the mentally disabled, physically disabled, elderly, ex-offenders, and drug addicts from asylums, psychiatric hospitals, nursing homes and correction facilities into community-based care systems, such as group homes, lodging homes, and halfway houses. This movement of marginalized groups provides an example of how deinstitutionalization functions. Dear and Wolch introduce the concept of service-dependent ghettos in urban spaces, referencing the concentration of reintegrated special needs populations and the services that assist them in urban spaces. The perspectives and 'livability' of community-based care systems are examined further by Gerber and Kirchner (2003) with a focus on blind

and visually impaired individuals. The authors find that although each person is different in his or her priorities for living spaces, certain criteria are important to everyone.

Gleeson's work (1997) links questions of service provision to social justice issues. Gleeson argues that individuals and groups should be entitled to meet their material needs as well as participate in society without fear of oppression based on social difference. As stated by Dear and Wolch (1987), this issue of social justice links together those with physical or mental disabilities, with the elderly, the poor, ex-offenders, and substance abusers while continuing to recognize the specific needs of each group.

The location of service provision has a significant influence on the lives of disabled individuals and especially on their decisions about where to live (Dear and Wolch, 1987; Imrie, 2000a). Since dependent individuals often need to locate near service providers, they will adjust their places of residence on that basis (Dear and Wolch, 1987; Imrie, 2000a). However, I argue that this concept may not be universal, and there are multiple factors involved in the choice of residence. Degree of impairment and extent of need as well as depth of social capital and independence are some fundamental attributes factoring into any person with special needs' choice of where to locate. If the impairment is severe enough, type of impairment will be the deciding factor in decisions about where to locate.

Hahn (2005) finds that people with impairments are known to go beyond the nearest medical service provision to seek treatment, and patients are willing to travel greater distances for treatment suitable to their individual impairment. Thus, the ghettoization concept is refuted when individuals, instead of gathering in a dense area near service provision, disperse to more distant locations. Hahn's study is important to

service provision as it is concerned with how the trend towards social factors of disability encourages recognition of enabling or disabling environmental features when considering and planning for health care facilities.

Additional in-depth discussion of deinstitutionalization as a political reform movement and the accommodating sociospatial restructuring is given by Gleeson and Kearns (2001). Opponents of deinstitutionalization contend that institutions and hospitals offer refuges for socially and economically vulnerable people within an increasingly hostile and insecure culture. In contrast, Gleeson and Kearns discuss Beck's (1998) ethics and morals that support community care. Deinstitutionalization and its substantial ethical foundations were originally fed by the efforts of three ethical philosophies. The first was the medical remedying ethics context and according to Prior (1993), it was based upon criticism against medical facilities. Next, Gleeson and Kearns discuss a 'rights-based' philosophical perspective to the ethics of care and the morals of medical treatment. Ethical dimensions of the institutional-community care dualism can also be considered from a social justice perspective.

Occupants' perspectives concerning livable communities have been examined by Gerber and Kirchner (2003), who delve into the perceptions of people with no residual vision and visually impaired participants throughout the life course to learn their opinion of 'livable communities' and what the important qualities are for such places. In doing so, the authors reach into the social model of disability (described in detail later but briefly explained here to argue that the cause of impairment is the environment and its social attitudes, such as how people perceive and act toward impairment) and the

personal experiences of people with impairments in the physical and social environments and the ways they achieve full cultural citizenship through ‘accessible’ communities.

In order to learn how people with disabilities, those with vision impairments in particular, perceive living spaces Gerber and Kirchner (2003) developed a research framework that illuminates the interaction between the environment and the life stage, while at the same time increasing the knowledge about the personal experiences of impairment and living space. Life course theory was selected because it satisfies these needs and in addition disputes popular stereotypes relating to people with disabilities as ‘stuck’ in the child phase of life and thus instead, highlights situations showing people with impairments as full adults and active seniors. Simultaneously, study data from their research suggest their informants across the lifespan agree that life stage is an important organizing means around which they orient their lives and make life decisions.

According to data collected by Gerber and Kirchner (2003), people with visual difficulties’ perspectives on what makes a community ‘livable’ will vary, but most of the respondents agree on several attributes. Geographic factors have a role, such qualities as geographic region and climate and population factors like population density and size are examples. Concurrently, it was revealed that respondents’ needs fluctuate over the course of life. This is where the study blends in with studies dealing with personal experience literature. Likewise, the authors use the personal experiences and perspectives analyzed from people with no residual vision and visually impaired participants in a life-course approach to determine ranks of livable and accessible communities.

It is important for scholars to recognize that their objectives might be manipulated in ways that they do not intend, and Gerber and Kirchner (2003) are forced to deal with this inconvenience. The authors are interested in the guiding principle of instigating community integration, but from the beginning realized that their project could in fact be misinterpreted in more ways than one. The authors do not intend for the results of their study to encourage those with vision impairments to relocate to a limited set of places, nor do the authors wish their project to be seen as supporting services that segregate disabled individuals. Accepting these possibilities, Gerber and Kirchner at the same time agree to the role of 'advocacy research' and construct a participatory action research methodology that represents features enhancing community livability and publicize their results so that everyone may view them. Another Participatory Action Research attribute recommended by Gerber and Kirchner's study is a national advisory committees consisting of vision impaired individuals who help determine the project's direction and distribution of findings. The authors use a purely qualitative approach to gather data, consisting of focus groups, and informal interviews, both organized by life stage. In addition to focus groups and interviews, open-ended and structured electronic and phone surveys completed the methodology.

Assuming the importance of life stage in making living spaces 'accessible' and 'livable' for vision-impaired individuals, Gerber and Kirchner (2003) identify two separate viewpoints for examining their data. One perspective is the outsider or researcher's lens in which the authors express environmental features known to be significant throughout the life course such as low crime rate and access to services. The other is the view of the respondent and how they understand and interpret their lives

throughout the life course. A return to the deinstitutionalization concept serves to expand the life course approach to living spaces and their accessibility.

Deinstitutionalization is investigated further with respect to hidden disabilities by Taylor and Eisele (2004). Hidden disabilities are those physical, sensory, or mental impairments that are not readily apparent to others (US Department of Education-Office for Civil Rights, 1973). In order to investigate attitudes and knowledge about Chronic Fatigue Syndrome (CFS) among personnel involved with Centers for Independent Living, Taylor and Eisele employ an educational intervention along with pre and post intervention interviews and evaluation with staff at a Center for Independent Living in Chicago, Illinois.

Participants were assembled from staff members employed at a Center for Independent Living in Chicago for Taylor and Eisele's (2004/) study. These individual informants consisted of forty-eight adult men and women of various ethnicities and seventy-five percent of who were identified as having disabilities ranging from physical to sensory to cognitive. Pre and post intervention questionnaires to assess knowledge and attitudes about CFS were distributed to the participants. Participants did not list their name on the questionnaires, and since their participants were of various ethnicities, the researchers had no way of knowing if any particular ethnic group had mixed feelings concerning CFS and Centers for Independent Living.

Taylor and Eisele (2004) report that the educational intervention methodology increased awareness of hidden/invisible disabilities among Center personnel. The authors note the great potential for this knowledge to allow individuals with hidden disabilities to receive extensive use of Independent Living Centers that are empowering and provide

peer counseling among other privileges. In addition, significant findings of this study for future community-based living networks revolve around individuals with invisible disabilities and service provision.

Van de Ven et al. (2005) contribute to an understanding of how people with impairments experience social integration. This article differs slightly from the deinstitutionalization literature in that Van de Ven et al. are concerned with people who were never institutionalized and are trying to function normally in mainstream society. That being said, Van de Ven et al. desire to develop a successful integration model using input from people with impairments' perspectives and the perspectives from those in their immediate environment. According to Van de Ven et al., successful integration means functioning within ordinary parameters without receiving special attention, blending with able-bodied people, taking part in society, making an attempt to realize one's potential, and taking possession of and directing one's own life.

Van de Ven et al.'s (2005) methodology is qualitative in nature, composed of literature reviews and several sets of in-depth interviews. The authors develop a model for people with impairments' successful integration into society. They constructed a preliminary integration model from information gathered from interviews with prominent disability movement activists and information from the literature. A second set of interviews was undertaken with people with impairments who were socially integrated so that their perspectives could be added to the model. Last, interviews were done with members of the social networks of the people with impairments in session two, both from the immediate social network and a broader social network.

Van de Ven et al.'s (2005) integration model accounts for social and subjective attributes of impairment, factors such as personal and social capital are considered. Most important in the model is the social interaction component of mutual respect-meaning that both people with impairments and able-bodied individuals should have a responsibility that demands respect for each other (van de Ven et al., (2005). Interestingly enough, the model corresponds with earlier radical social disability models (Imrie, 1996; Chouinard, 1997; Gleeson, 1999) in that the model argues society must be inclusive by way of anti-discrimination litigation. The integration model developed by van de Ven et al., with all its social attributes, enables it to be ensconced within the social model of disability while simultaneously displaying new medical model attributes. New Medical Model (Butler and Bowlby, 1997) characteristics place van de Ven et al.'s model into the production of difference literature stream. The integration model counters production of difference with its positive social attitudes which respect people with impairments and are based on commonalties among people.

Access to service provision is examined in the United Kingdom by Heyman et al. (2004). They argue that service providers attempting to provide care for untraditional health needs must simplify their services, but such standardization and routinization has the potential to result in diagnosis errors, and at times even fails to recognize needs. These problematical occurrences are explored later by Law et al.(2005) in a similar context-that of people with communication disabilities. Secondary complexity resulting from organizational simplification is hypothesized by Heyman et al. as a possible explanation for the odd behavior of service providers.

Heyman et al. recognize the *varying degrees* of the impairment of interest, learning disabilities, and the terminology associated with it, and special attention is paid to adults with learning disabilities' *social needs and societal responses* to them (Heyman et al., 2004). This recognition of degrees of impairment and social phenomena places the study nicely into the new medical geography model of disability proposed by Butler and Bowlby (1997). Concurrently, Heyman et al. (2004) develop a model of emergent factors and relationships to secondary complexity resulting from organizational simplification.

Heyman et al. (2004) give examples of reproductions in the social context. For instance, living circumstances represent adults with learning disabilities' influence on health provision, and this is evident in their service orientation and individual/service needs. The context of care can be influenced by service user indirectly for example, when he/she is institutionalized inappropriately due to mix-ups in service delivery. Power and control relations too will demonstrate how either the role of service user or the service provided is a factor in the other's status. For instance, when a service user feels powerless because an organization simplifies care, and in doing so fails to accommodate their needs. Conversely, exclusion shows its presence and demonstrates the individual affecting the services provided, when patients accept their exclusiveness from organizations that choose to dismiss special needs as unnecessary and intolerable, and allows the service to continue its exclusive behavior. The communication attribute comes into effect when service providers' ability to communicate effectively with various patients' special needs, and in turn, communication is influenced by organizational simplification when services are categorized and the new skills to meet the needs of various anatomical differences are not required. Without need for elaboration, the

participants in Heyman et al.'s investigation shared the opinion of labeling services that recognized their special needs as inclusive, while the opinion of services that did not as exclusive.

Heyman et al. (2004) also made use of semi-structured interviews in their study. Concomitantly, the authors note that participants from a range of adults with learning disabilities, family carers, and health service professionals upon given options for hour-long question session locations, were asked about their perspectives about the health needs of adults with learning disabilities and current health services, and opinions regarding ways in which these services might be improved. Also of note is that informants were chosen after discussions with professional service providers who were asked to identify clients suitable for the study. Accordingly, the open-ended and researcher-guided interviews made respondents feel encouraged to be specific about their experiences with health care. As a result, eight individuals with learning disabilities, aged 18-41, decided to participate, and five interviews took place. In addition to the adult with learning disabilities, during the interviews the researchers made efforts to include family members involved with caring for the individual.

Heyman et al., (2004) utilize additional forms of qualitative data gathering methods. Two conferences and one multidisciplinary specialist group were organized consisting of adults with learning disabilities, family carers, social service and service provision specialists, academics, volunteers, and the researchers. These gatherings explored a range of objectives, from the opinions and experiences expressed in previous interviews to the sharing of emergent themes.

Heyman et al. (2004) emphasize an important quality, -their data are unrepresentative because they were taken from small samples, and should only be generalized with extreme caution. Moreover, while the narrative-descriptive research methodology taken by the authors has the potential to highlight the negative attitudes of respondents toward exclusionary health service experiences, it is also noted that health professionals and carers might tell different stories. Given these circumstances, interview accounts are centered on the major themes and accompanying social relationships. The before mentioned social relationships are a function of the complexity resulting from organizational simplification. Following each thematic oriented passage, the authors briefly explain and interpret the meaning of each relative to their argument. Simultaneously, no conclusions are drawn regarding the extent of exclusion of adults with learning disabilities from access to health services. And, the reason for this is the case of adults with severe or profound learning disabilities who are unable to speak for themselves during interviews/focus groups or give informed consent. Such individuals were investigated only from the perspective of their carers (Heyman et al., 2004).

Communication disorders and service provision in the UK are examined by Law et al. (2005), who write in a different context from the deinstitutionalization context. They conclude that effective transmission of information between service users and service providers is not a simple set of taught behavior, but represents a set of values and initiates conditions for improving medical results. In suggesting that people with communication disabilities are a key factor for whether service providers are adequately trained in this regard, Law et al are emphasizing communication's fundamental role in access to health care and health care consultation. Law et al. demonstrate the imbalance existing when

service users experience certain predicaments with verbal understanding, formulating incomplete sentences, or phrases, or the provider in using their skills with different patients. This breakdown in discussion tends to result in miscommunication between medical professionals and patients, often resulting in wrongful medical diagnosis or wrongful treatment (Law et al., 2005).

In order to research access to service provision for individuals with communication disorders, Law et al. (2005) used qualitative techniques. A method consisting of open-ended and topic guided interviews with participants who had various degrees of communication disorders and their carers, proved to be practical for the study. The authors, in acknowledging the severity of communication/cognitive disabilities and interviewees' lack of familiarity with the researcher, agreed to allow carers to accompany participants during interviews. Carers included spouses, ex-spouses, partner, parent or family member, or paid service provider. Service users and their carer did not influence the methodology in a direct manner, but they did play several roles in the study, and not just as interviewees. Accordingly, participants served as advisors for the researchers, interpreters of the study findings, and representations at steering group meetings whose objective was to acknowledge persons with communication disabilities' sensitivities and identify themes arising from interview data. Furthermore, the authors included special accommodations for the interviewing process, such as using concrete vocabulary and referring to objects and persons in the immediate environment. Additional techniques included facial, vocal, and body gestures that were made available to account for underprivileged communication.

Independent living in the case of people with learning difficulties, the social capital available to them, and their ability to take control of their own life, all make up another service provision context. Indeed, Race et al. (2005) find the social and radical approaches (further discussed under personal experiences) applicable in challenging society's negative assumptions and behavior toward people with disabilities, and according to Race et al. both models promote people with disabilities' ability to live and act independently by supporting the notion that an individual's corporeality is not the cause of their social disadvantages. Likewise, a new meaning of independence arises that challenges social barriers, an understanding of this concept meaning the degree to which one *controls* his/her own life (as opposed to the amount of physical tasks one can perform, or doing everything for his/herself) and the support him/her receives and the freedom to make choices relating to the support.

It is notable that during their descriptive analysis, Race et al. (2005) follow the proposed terminological typology of Bolt (2005) (discussed under Personal Experiences literature below). My research also agrees with and will use Bolt's typology. Likewise, terms such as *impairment* instead of *disability* and *people* instead of *persons* are examples. It is also pertinent that these authors are proponents of the new medical geography (Butler and Bowlby (1997), discussed under the Personal Experiences literature stream). Race et al. go on to summarize the two models with respect to people with learning difficulties and point out misinterpretations in them.

Social Role Valorization (SRV) attempts to understand vulnerable individuals, including people with impairments, and how/why they are devalued in and by society and/or the political and economic social elite. Overviews and detailed evaluations of

Social Role Valorization can be found in Wolfensberger (1998, 2000) and Race (1999; 2004), but for this particular project a brief synopsis will suffice. Actually a refined concept of normalization, one of the key components of SRV, is ‘common experiences’ widespread to devalued people in society (Race, 1999), and these everyday experiences reveal incidents that can be observed and have been (Barron, 1996; Ryan and Thomas, 1987) through empirical observation. During the devaluation process and accompanying the ‘common experiences’ are the ‘symbolic stigmatizing’ of vulnerable people- expectations and perceptions that devalue vulnerable people, thereby producing a devalued identity upon them. The authors see the expectations, negative social assumptions and perceptions of mainstream society towards vulnerable individuals as ‘channels’ producing difference in the same way as the social model sees the medical model producing difference by emphasizing impairments. This also suggests inclusion within the production of difference literature stream.

Race et al. (2005) next discuss the Social Model of Disability, and social causes as opposed to impairment as the cause of oppression. Emphasizing society as perpetuating oppression is considered a radical process, and is discussed more thoroughly under the personal experiences subject later in this dissertation. Nevertheless, Race et al. discuss Social Model origins and how it has been criticized for failing to acknowledge the real pain, suffering and experiences of impairment. With respect to social capital, the authors add to this radical concept the suggestion that people who have an impairment which is perceived as ‘severe’ or ‘profound’ are restricted in their social independence, not as a result of their impairments but due to exclusionary social, cultural, and political barriers beyond their control. Of particular significance to Race et al. is that people with leaning

difficulties are not specifically mentioned in Social Model literature. Nevertheless, according to Race et al., Social Model discussions (Goodley, 2000) have in recent times made efforts to amend Social Model components to include those with learning difficulties and their experiences of social oppression.

Although SRV and the Social Model of Disability are different, there are commonalities between them. Indeed, Race et al. (2005) point out that both models are surrounded by similar features grounded in how others perceive people with disabilities. Likewise, there is agreement within both approaches on causes (social causes) of discrimination toward people with disabilities, and the two models challenge social barriers. There is a strong correlation here with the new medical geography as the new medical geography emphasizes that society's perceptions and thoughts and behavior towards impairment that makes all the difference. In addition, Race et al. demonstrates in relation to how people with learning difficulties organize the assistance they receive in removing oppressive barriers. I now turn to a discussion on production of difference.

2.4 Production of Difference

Production of difference literature examines the social oppression of special needs groups in a socio-spatial context. Simultaneously, scholars speaking or writing about dependent populations risk marginalizing those same social groups by reproducing their 'differences' from mainstream society. One way of avoiding this risk is to liberate disadvantaged social groups by stressing their commonalities with able-bodied people instead of their differences (Golledge, 1993; Dear et al., 1997; Driedger et al., 2004). A common argument among disability scholars is that while geography has shown considerable interest in parallel or similar issues, for example marginalized groups such

as the elderly, ethnic minority groups, homeless people, ex-offenders, the disempowered, and the poverty stricken, people with impairments need to be included with these other groups.

As noted above, the manner in which society perceives and understands impairment is fundamental to producing difference, notably, whether commonalities or distinctions are stressed. Dear et al. (1997) introduce the idea of ‘social hierarchies of acceptance’ and the stigmatizing of people with impairments through social attitudes and imaging. ‘Social hierarchies of acceptance’ exist because people with impairments and their ‘contingent differences’ -meaning their various impairments exhibit ‘difference’ from able-bodied people. In addition, Dear et al. argue that the terminology used to refer to physical and mental impairments reflect dominant trends within social environments. Highlighting impairments thereby strengthens distinctions between abled and disabled and hence, reproduces ‘difference’. The authors further contend that spatial practices such as segregation and incarceration within institutions also contribute to producing difference. Wendell (2001) parallels Dear et al. (1997) when she discusses the danger of writing or speaking about disability issues. The author of this dissertation agrees with Dear et al. and Wendell, and further believes that emphasizing differences has the potential to simultaneously support biomedical model definitions of disability. Recognition of this potential risk reflects to new medical geography perspectives (see below).

Perspectives that prioritize commonalities rather than differences are becoming accepted with scholars researching disability issues. Parr (1997) stresses this point as she complements Chouinard’s (1997) statement about the ‘difference that difference makes’

– meaning that impairments cannot be lumped together because all disabilities are different and this difference matters. Furthermore, and repeating the point made by Golledge (1993) and Dear et al. (1997), specific impairments such as mental and physical are not the same and distinguish separate identities. Simultaneously however, the commonalities in the manner in which people with impairments are marginalized, excluded, disempowered, biologically scripted, and isolated must be recognized. In addition, Parr notes how such wrongful diagnosis is common in the case of hidden impairments like cognitive impairments. Accordingly, Parr discusses different types of mental impairment, and notes the greater potential for negative responses to mental impairment on the part of non-disabled people than for disabled people.

Scholars use production of difference to criticize city and state government agencies for continuing to allow the design and construction of urban landscapes that do not adhere to the Americans with Disabilities Act.² This is a popular theme in production of difference literature, and many different perspectives are examined. For example, the development of closed cities and categorization of individuals into distinct groups in the way society thinks and talks about impairment (Gleeson, 1999; Imrie, 2000b, 2000c). Arguments centering on ‘closed cities’ blends into literature on accessibility and mobility in that the objective is to critique of cities marked by inaccessible places and spaces. As Gleeson (2001) notes, ‘closed cities’ are those cities characterized by physical inaccessibility and exclusion from socio-spatial mainstreams, including housing and employment markets. Furthermore, Imrie (200c) probes into the minds of urban designers and property professionals to explore their agendas and the socio-institutional restrictions placed on them. He uses the potential for participatory action to conclude

² For details about the Americans with Disabilities Act see Appendix.

that, while no single set of mitigation procedures will make the urban landscape satisfactory for everyone, some, such as the inclusion of special needs groups in the planning process, can relieve accessibility problems in built environments.

Sibley (2001) complements Gleeson's (2001) idea of 'open' urban landscapes, and avoids emphasizing distinctions by stressing commonalties. Furthermore, Sibley criticizes binary nature of categorizations among social groups in cities that create social spatialities. He recognizes that the classification of social groups with demarcations like disabled/abled, sane/insane, diseased/healthy, and biomedical scripting further produces difference instead of emphasizing commonalties. Accordingly, Hawkesworth (2001) demonstrates that producing difference is not only exhibited by physical and mental impairments, but also through appreciative social expressions and attitudinal social norms deriving from capitalist modernization (see next paragraph) that emphasize aesthetic bodily appearance. She uses personal interviews to demonstrate how people with acne are discriminated against in the same respect as other marginalized social groups, and explores potential ways to increase awareness of this problem.

As noted at the beginning of this section, production of difference is strengthened when differences are emphasized instead of commonalties. Production of difference has historical beginnings. Beck (1998) provides a historical analysis of capitalist modernization that reviews the economic and political transformations brought on by the Industrial Revolution as producing exclusionary institutions and places. Furthermore, Gleeson (2001) extends Beck's theory by relating it to the social disability movements struggling for accessible institutions and spaces.

Another congruent theme in production of difference literature, and which dovetails with the literature on service provision, is the institutional circumstances in which patients are categorized or biologically scripted and spatially separated according to their biomedical diagnosis. Park et al. (1998) examine this classification of patients in the mental health context, while Dear and Wolch (1987) emphasize spatial separation for a wide variety of oppressed institutionalized groups. Park et al. clarify what is called the geography of mental health, and note that it has traditionally been divided into studies of ‘asylum geographies’, dealing with the locational dynamics of mental health-care facilities, and studies dealing with ‘psychiatric geographies,’ which deal with the spatial distribution of mental illness.

Kitchin (2000) documents the process of researching people with impairments in its entirety while exploring their researched opinions during disability studies. While interviewing people with a range of physical, sensory, and psychological impairments, the author examines a multitude of factors from experiences with research to thoughts and attitudes about disability research itself, including whether or not disability research is helping them. In a relating theme, questions were asked about how research on disability should be undertaken, and who should be performing research on disability. Results reveal that interviewees favor liberating, inclusive, and empowering types of research, such as participatory action and where disabled respondents serve as consultants and/or partners in the research. Kitchin also found that these opinions relatively parallel recent thinking of disabled scholars doing disability research. The author notes, however, rare occurrences when respondents favor an exclusive approach to disability research, an approach that is done by ‘neutral’ non-disabled outsiders. Reasons for this centered on

concerns that researchers with a specific impairment might have an agenda, and thus focus their efforts around themselves.

In accordance with participatory action-based standards, Kitchin (2000) includes passages from his interview conversations between him and his informants, but is careful to note that the information given in these interview conversations is situated and not universal. Respondents were generally young, well-educated, were familiar with the politics of disability and disability literature, and to some extent were active campaigners for disability rights. The majority of his participants were strongly in favor of specialized disability awareness training for non-disabled researchers. According to the author, such a procedure is important to the subjects' state of mind, to know that the researcher is well informed in the subject matter, and so that he/she approaches the project accordingly.

Respondents in Kitchin's (2000) study expressed concerns with respect to publicizing study results. Study participants met as a group to discuss deficiencies with regard to broadcasting research outcomes, in addition to strategies alleviating this concern. Negative attitudes toward questionnaires and surveys were voiced because of their limited space for expression of thoughts, opinions, and feelings. Strong support for qualitative methods was the major attitudinal voice expressed during discussions, accompanied by inclusive and empowering strategies for research. Simultaneously, in-depth discussion-based and flexible focus groups were another method that was popular for disability research.

Upon analyzing interview data, Kitchin (2000) generalizes that people with impairments favor their personal involvement in academic disability research, as well as research concerning people with impairments. In addition, participants question

whether scholars doing research about disabilities are actually doing research that emancipates and empowers its subjects.

Wendell (2001) distinguishes the social constructionist disability model from the biomedical model using personal identity and individual corporeality. She argues for an acceptance of chronic illness as a major cause of disability, and contends that women are more likely than men to experience disabling chronic illness. Wendell argues that feminism and feminist politics should adequately understand disability as well as chronic illness, and these points mirror the linkages between feminist literature and disability scholarship (further identified in Chouinard, 1997). In addition, and strongly relating to the association between chronic illness and disability, Wendell introduces healthy disabled and unhealthy disabled identities, and notes that these identities influence everyday life activities.

A somewhat contradictory yet distinguishing factor noted by Wendell (2001) is the separation of chronic illness from disability and associated identity issues. Wendell gives examples of this important feature, notably that it is not uncommon for people to be disabled by their chronic illness, or sometimes people with disabilities acquire chronic health problems that are caused by their disability(s). Despite these functional relationships, the author indicates that there is reason behind contemporary disability rights movements opposing any association of disability with chronic health problems. Accordingly, disability rights proponents argue that the rationale behind this is that any identification of disability with chronic illness strengthens biomedical abnormalities or the medicalization of disability, and this proceeds to make social causes of disability redundant. Likewise, Wendell differentiates healthy disabled-people, whose physical

conditions and functional limitations are relatively stable and predictable in the short term and who do not need or require medical treatment any more than anyone else, the unhealthy disabled-those whose physical conditions and functional limitations are generally unstable, constantly seeking medical attention, usually obtaining illness later in life.

Wendell (2001) also identifies impairment as a category that obscures corporeality. According to her, writers who study disability as well as disability activists differentiate between impairment-understood to be medically defined corporeality-and disability-understood to be socially constructed disadvantage based on impairment. Further, Wendell argues that this perspective, based on the United Nations definition of impairment (United Nations, 1983, I.c., 6-7), connects impairment to medical institutions that set standards of 'normalcy.' Accordingly, Wendell sees this as debilitating to social constructionist perspectives on disability. Likewise, Wendell acknowledges the similarities between impairment and illness that are not found in relationships among impairment and disability, notably the recognition that people with disabilities are not necessarily diseased or sick.

Differences among people with impairments and employment experiences are discussed by Wendell (2001) in an attitudinal context. Wendell argues that in order to reduce difference in the workplace, attitudes and demeanors will need to change. Accordingly, the author illustrates a diverse range of incidences showing how people with impairments, due to their fluctuating abilities and limitations, are often seen as unreliable employees. Dear et al.'s (1997) 'contingent differences' in the form of time and energy restrictions common to their bodies are an example. Likewise, according to

Wendell, adhering to contemporary paid workplace pace and scheduling standards represents a different ideal to people with impairments; it can mean danger and risk to functional capacities leading to hospitalization, energy exertion leading to complete physical and mental relapse, and misunderstanding of their special needs, and desire to contribute.

Accommodating people with special needs in the paid workplace is a controversial area in this context. Wendell (2001) argues that when employees with impairments demand accommodations in the workplace to compensate for their impairments, they are placing their own employment status at risk. Likewise, according to Wendell, when employees with impairments make these demands in order to conform to employer pace and/or time standards, aspects of 'normal'-energetic, adaptive, stress retardant' job performance-they are viewed as an undesirable employee and also fail in the eyes of their employers. Concurrently, when any worker is unable to measure up to standards, with some individuals requesting accommodations, norms will be called into debate. According to Wendell, this will initiate a power controversy, as those requesting accommodations challenge the power of their employers to set employee standards of normalcy. Individuals with disabilities and their personal experiences in the workplace indicate production of difference when acquiring accommodations, and this context is discussed further by Wilton (2004).

Wilton (2004) blends all four disability literature streams originally proposed by Gleeson (2001). In his article, Wilton examines the personal experiences with paid employment. According to Wilton, labor market participation has changed in past years and is still changing, and these changes have had serious implications on people with

impairments. Wilton contributes to the limited geographical literature on relationships between people with impairments and organizational paid employment. We see this in power relationships and control within workplaces to facilitate employee efficiency and productivity. In addition, workplace modifications that compensate for personal impairments are indicators of changes to accommodate people with special needs so that they are able to accomplish certain tasks, (Wilton, 2004).

Wilton (2004) has three objectives in writing his article, and these three objectives span all four disability streams outlined in Gleeson (2001). First, Wilton examines the personal experiences of employees with impairments in the paid employment environment, and found that such individuals experience a lack of control over their work environment, and a lack of accommodations to compensate for their impairment(s). In addition, Wilton analyzed the personal experiences as problematical in the way employees relate to on the job training, multi-tasking, speed, and demands for emotional and aesthetic labor. Hochschild (1983) defines *emotional labor* as a type of labor required to induce or suppress feeling in paid jobs in order to influence others, specifically clients or customers. On the other hand, *aesthetic labor* is when the appearance of workers' bodies is used to influence clients or customers (Halford and Savage, 1997).

Secondly, Wilton (2004) is concerned with valued identity implications in the workplace for special needs employees, and the potential for a respectable social identity. This objective places the article within the production of difference stream because Wilton's analysis suggests the identities within the workplace are both marginalizing for some, and liberating from state dependency for others. I see liberation of people with

impairment through providing necessary accommodations, not only in the workplace but in social and familial personal experiences, as a type of relative accessibility-as argued in Church and Marston (2003). In addition, accommodations provide a balance for individuals who cannot operate to a certain extent in mainstream society.

A third objective that Wilton (2004) pursues is to understand the connections between paid work environment and broader workplace geographies for employees with impairments, specifically a deeper understanding of accommodation. In this respect, Wilton relates accommodations through discourse and actual practice, and in short, Wilton's informants stressed a wide shortage in accommodating practices in the workplace. Another significant connection made by the author concerns the conception of accommodation itself, mainly comprehending a definition of accommodation that is not based on fitting them employees with special needs into labor processes modeled on able-bodiedness (Wilton, 2004). According to Wilton, critical to the formation of a new definition of accommodations will be connecting workers with their able-bodied counterparts, and this relates to liberating individuals with special needs by stressing commonalties among people (Chouinard, 1997; Dear et al., 1997; Parr, 1997; Butler and Bowlby, 1997; Hawkesworth, 2001). Wilton (2004) acknowledges the social model of disability (discussed below under personal experiences) and further contributes to the new medical geography model of disability (Butler and Bowlby, 1997 through a study of employees with impairments at Hamilton, Ontario.

Shah (2006) researches the perspectives of people with impairments toward disability research. Her research participants consisted of full-time mainstream or special education institution students. An attribute separating these two authors, however, is the fact that

while Kitchin is able-bodied, Shah has an impairment. Fundamental barriers recognized by Shah (2006) as a researcher hindered with impairment, are obvious to her yet indistinguishable to the reader. The author gradually develops her foremost research strategy, viewing the solutions for the unidentified barriers as *opportunities* and *challenges* open for the researcher. Shah uses the concept of empathy to weaken the barriers facing her, and to gain useful data from her subjects. This strategy provides the author a means to understand other people's experiences in the context of both similarities and differences between the researcher and participants. One other technique that Shah implements to this effect, is to use herself as a tool, being fully aware of the similarities-challenging social oppression and social exclusion, and differences-race, gender, disablement-between the researcher and the researched while growing up, in order to uncover social realities in the life of her participants.

While using empathy, there is a consistent risk of developing an over-bonding with informants. Aware of this risk, Shah (2006) assumed a distinct dividing line between pleasantness and business demeanors when dealing with her subjects. This conduct served to encourage the role-modeling process. However, production of difference comes into effect here, as Shah cites Reay (1996), acknowledging the distinction between identification with research participants and their exploitation. It follows that power relationship differences have the potential to obliterate possible beneficial and commonalities-based interaction. Identification among researchers and their subjects is another possibility. According to literature concerning production of difference in this dissertation (Chouinard, 1997; Parr, 1997; Gleeson, 1999; Imrie, 1999; to name a few), when researchers speak or write about difference with their subjects, they risk

reproducing oppression and exploiting respondents. Shah notes that differences she encountered between her and her informants proved to be satisfactory enough for her to retain the objectivity required for personal reflection and reactive to participant dialogue. In this way, the author's research was empowering instead of exploitive.

Shah's methodology consisted of classroom observation, forum theatre workshops, and individual interviews. According to the author, this methodological triumvirate gives respondents the opportunity to make their views and perceptions known pertaining to their role as active social agents who are capable of making their vocational futures. In what follows, I provide brief discussions on the methods used by Shah in her study beginning with direct observation and then moving on to forum theatre workshops and then the personal interviews.

The first methodological phase conducted in Shah (2006) consisted of direct classroom observation. While done in an overt fashion, Shah made efforts based on non-interference with classroom activity, and she suggests that this method gave her a means for recording respondents' interactions with peers, and the meanings they ascribe to these contexts. Accordingly, Shah goes on to describe how her research avoids the critiques that observation without participation might lead to subjectivism-where the observer's surmises are substituted for those of the actor-by doing her observation prior to the individual interviews and providing a breakdown of research questions.

Another context of importance in production of difference is its political influence. Production of difference is a critical part of indigenous activism. Accordingly, indigenous activists emphasize their political and economical disempowerment difference as a strategy to influence changes in oppressive policies

(Kicza J. 1993; Warren and Jackson, 2002; Montejo, 2002; Jackson, 2002). Such indigenous activism often results in positive outcomes such as regional autonomy rights (Rappaport, 1996), assertion of identity (Graham, 2002; Jackson, 2002), and self representation (Montejo, 2002). Likewise, disability activist discourse complements indigenous advocates, placing emphasis on difference in order to increase awareness of people with impairments' extreme vulnerability. Contradictory to the strategy that emphasizes difference is the approach taken by academics like Golledge (1993) and Chouinard (1997), who risk reproducing difference when speaking or writing about impairment. Therefore, academics take the opposing approach which emphasizes commonalities in order to de-emphasize difference. As a result, there are currently two strategies in which production of difference is being used, each with separate objectives. In addition, the causes and the end results of both strategies are dissimilar.

Production of difference is placed into disability context by Gleeson (2001) as one of the central components of disability studies. Further examination reveals that production of difference can be expanded as a strategy to influence social and political change. At one end are activists who place emphasis on difference, and this is visible with two social groups. Disability activists, such as Rains (2006) and Kailes (2006), who tend to place emphasis on difference in order to stimulate changes in policy. Of particular note is the hazards and emergency management context. This is evident following the Indian Ocean tsunami in 2004 and hurricane Katrina in 2005 incidents when it became necessary to highlight the lack of emergency management concern for people with impairments. The result is the explosion of an activist presence (Rains, 2006; Kailes, 2006; American Red Cross, 2006) that closely resembles activist support

for oppressed indigenous groups lobbying against all scales of government and emphasizing difference as a strategy to influence political change. This justification, necessity for activism, and the unfortunate truth with respect to natural hazards is given by Bérubé in that people with disabilities “were depicted as objects of charity, or horror, or pity; but disability as a category of human identity, disability as a social and political fact, and disability *as a factor in public policy* remained inconceivable” (2005, 1) (original emphasis).

At the opposite end of the spectrum, we find the dialogue taken by academics writing and speaking about disability (Dear et al., 1997). When writing and speaking about disability, academics run the risk of further oppressing those same social groups by reproducing their ‘differences.’ To reduce the risk of further marginalizing oppressed social groups and reproducing their differences, scholars strategize and place emphasis on commonalities, thereby de-emphasizing difference, such as in the writings of Golledge (1993) and Chouinard (1997).

I therefore wish to bring to attention this dualism in strategic use of production of difference. Whether emphasizing difference to influence political change or deemphasizing, difference to increase equality, both strategies are widely in use though not as noticeable as the events leading to the change. It is the actual end results resulting from the strategic use of difference that are visible in society.

2.5. Personal Experiences

Gleeson’s (2001) literature stream focusing on personal experience interprets the everyday life experiences of people with impairments, often focusing on certain activities

such as work or social life activities. Further, it is common for the personal experiences literature to identify the writer's position or attitude toward disability. One way to view impairment is from the perspective that people with special needs should adapt to society through technological innovations as a counterbalance for their impairment. This approach is sometimes associated with the biomedical model of disability, which defines impairment in terms of biomedical scripting and medical diagnosis. Golledge (1997) views impairment through this perspective. His narrative-descriptive account of his own encounters with visual impairment and his trek to continue his life's work as an academic using technological innovation to ameliorate his visual impairment is an example. He interprets everyday experiences with the restrictions imposed by impairment, and criticizes the social model of disability (see below) for its emphasis on treating all disabling conditions as if they derive from the same source, thus denying the humanness of impairment. This argument complements the new medical geography perspectives discussed below.

More common today is a radical approach to disability, which is associated with the social model of disability, and argues that society needs to adapt to disability (Imrie, 1996; Chouinard, 1997; Gleeson, 1999). Radical approaches criticize the biomedical model for ignoring or even legitimating social inequality and oppression. Imrie (1996), Gleeson (1999), and Chouinard (1997) each give accounts of the social disadvantages experienced by people with impairments. However, the social model itself is now in a transition stage, as a number of writers are beginning, in turn, to critique the social model for its over-reliance on a strictly or purely constructivist approach. Writers such as Butler and Bowlby (1997) argue that the social model of disability commonly ignores or

relegates the material or corporeal nature of impairment, thereby denying or trivializing the pain and suffering commonly associated with impairments.

Butler and Bowlby (1997) contribute to the theoretical development of the disability literature by extending the social model to include corporeality in its entirety. An additional argument relating to interpretations of the social model expressed in Butler and Bowlby (1997) and Dyck (1999) is that an individual's identity and position in life is dependent on his or her body, and bodily differences will thus affect personal experiences. There are clear parallels here with feminist ideas concerning the social construction of identity and position. With respect to this study, impaired bodies will perform certain actions in perceiving, reacting, and responding to severe weather warnings that tend to differ from those of able-bodied people.

Authors arguing for amendments to the social model continue to stress the recognition of various kinds and degrees of impairment, instead of lumping them all into a single group. Here there are parallels with Dear and Wolch's earlier claims. Likewise, this new school of thought acknowledges the links between different corporealities. Limitations, pain and suffering, and isolation and exclusion, are examples of these connections. Parr and Butler (1999) along with Dear and Wolch (1987), develop perspectives and theoretical models further, and suggest a new medical geography approach that incorporates these ideas and concepts. Accordingly, this project will view impairment through a new medical geography perspective.

Eisenman (2003) provides a telling narrative about his personal experiences with a degrading physical impairment. The impairment and the resulting psychological pain forced Eisenman to adjust his lifestyle severely. Correspondingly, the author documents

his interaction and grievances with the medical profession for leading him astray. Likewise, wrongful diagnosis and `treatment were the result of not considering secondary symptoms. Wrongful diagnosis on with respect to new medical geography ideas, and failure to recognize corporeality in its entirety, continued as the author was diagnosed with a profound medical predicament, and medical doctors prescribed a physical treatment that disagreed with the original physical impairment.

Eisenman (2003), like Golledge (1997), interprets everyday life experiences with the restrictions imposed by his impairments. Both authors express strong disapproval for the biomedical model of disability and its policy of limiting the healing process to main symptoms, thereby disregarding side effects and the social causes associated with disability. This argument by Eisenman, like the one written by Golledge (1997), complements new medical geography model ideas and human attributes.. Associated with Eisenman's relationship with health professionals' reliance on biomedical model standards are his association with assistive technology.

Service provision was slow in coming for Eisenman (2003). He documents his difficulty in obtaining the help he required. This delay in getting needed service only added to the author's need for psychological adjustments and identity shifts, such as coming to realize his limitations, and facing the inability to do activities he once took for granted. Eisenman does not identify himself as disabled, although he recognizes that sometimes realizing his difficulties will lead to acceptable behavior and needed assistance

It is interesting to note here that Eisenman (2003) realizes that people often act or perform in accordance with how they see themselves. This affects my study of people

with impairments and weather alerts. Eisenman acknowledges the new medical geography model of disability because he does not identify himself as one who is different. Rather, he sees himself as an academic and as a parent, and therefore he recognizes his commonalities with the mainstream population instead of as someone who is different.

The heart and soul of disablement's personal experiences is eloquently demonstrated in an interpretative analysis by Driedger et al. (2004). Respondents in the study had previously been diagnosed with Multiple Sclerosis (MS), and provided narratives describing their personal experiences relating to coping strategies and changing identities. There are coupled objectives in this study, (a) to explore coping strategies of individuals with MS in terms of dealing with their new bodily limitations and social relationships, and (b) to explore engagement in the process of disablement in changing temporal and spatial environments relative to their new found limitations. It is fundamental to note that Driedger et al. recognizes that people with impairments adapt and respond in different ways.

Moreover, the authors argue that individual corporeality and social placing, both public and private spaces, are intertwined and affect personal experiences of difference in all its variables and relationships. Another argument made by the authors is that relationships expressed in the previous argument are experienced through time, space, and place, as people with impairments engage in process of disablement-describes how chronic and acute conditions affect functioning in specific body systems, genetic physical and daily mental actions and activities, and describes personal and environmental factors that speed or slow disablement, namely, risk factors interventions and exacerbators

(Driedger et al., 2004). Furthermore, according to Guccione (1994), the process of disablement centers on integration of several attributes including age, sex, education, income level, social support, health care experiences, and environment, to name a select few.

Driedger et al. (2004) conceptualize the disablement process as having three main elements; these being time, space, and place. Time is significant because as one becomes more acquainted with experiencing impairment, he/she can develop coping strategies in everyday life. Space and place are just as important as time in this coping process because changes occur as people with impairments manipulate public spaces and private places in order to adapt to their bodily changes.

The authors find it significant to distinguish between having an impairment, a chronic illness, and a disability. I reference several authors in distinguishing the three. The differentiation is important to the process of disablement because it shows the temporal and spatial components. Therefore, according to Hughes and Patterson, (1997, 328), an impairment “refers to biological dysfunction.” Secondly, chronic illness “is an ongoing biophysical or psychological condition, which normally involves therapeutic interventions (Parr and Butler, 1999, 8). Lastly, a disability is “any lack of ability to perform activities to an extent or in a way that is either necessary for survival in an environment or necessary to participate in some major aspect of life in a given society” (Wendell, 1996, 23).

Biomedical definitions referenced by Driedger et al. (2004) in the above paragraph are based on a social model of disability, defined at the beginning of the personal experiences section above, and informs the study by the authors. Nevertheless, the

authors note the gradual shift in disability scholarship away from a traditional biomedical definition of disability, with an emphasis on corporeal bodies, and towards the current social definition of disability, which is based upon social exclusion. In addition, Driedger et al. (2004) urge inclusion of the abled/disabled dualism with other socially constructed classifications commonly scrutinized by geographers, and this recognition of these commonalities is an attribute minimizing the production and reproduction of difference.

Driedger et al. (2004) use a qualitative semi-structured interview format in their study, recording verbatim the narratives of fifteen self-identified individuals, both men and women, who had been diagnosed with MS and who resided in Ottawa, Ontario, Canada. Following interviews and recording the narratives, the authors interpreted the narratives in the context of objectives stated in the above paragraphs. Interviews for this study covered topic areas such as the daily routines of each respondent, issues surrounding diagnosis, how the respondent relates to his or her immediate physical surroundings (including both indoors and outdoors), organization/reorganization of home and social activities, concerns and fears of coping with MS, MS as a factor in a decision to change residence, employment history, and how respondents see his or her future.

The authors performed a thematic analysis of the narratives, thereby constructing 'diagrams' for each participant's narrative. Diagrams in turn provided visual thematic representatives of the processes and patterns of social and physical barriers concerning each individual participant. The process of moving from transcribed interviews to analysis of transcribed narratives to the diagrams helped identify such themes as contextualizing the body and place of study participants, personal changes and

adjustments and self-identity and relationships, and relationships with the physical environment and renegotiating everyday life spaces.

Bolt (2005) interprets the social model in an interesting manner, and it is debatable whether his thinking encompasses new medical geography thinking. Bolt complements Dear et al. (1997), and to some degree Wendell (2001), both who subtly grasp new medical theory, in suggesting terminology as a key component in psycho-cultural representation of people with impairments. In the visually impaired context, Bolt thoroughly follows Gleeson (1999) in performing a typological autopsy of past and present terminological disability dialogue, and points to outdated biomedical based terms, as well as postmodern and contemporary politically correct phrases. Accordingly, the author proposes a tripartite interpretation that challenges those who speak and write about disability to rise above discriminatory discourse.

Bolt (2005) first probes into a theoretical discussion about disability terminology. The first phase in Bolt's examination centers on the theory of ableism—the set of social disadvantages and discriminatory demeanor of society and practices producing them that people with disabilities are forced to deal with (Imrie, 1996; Chouinard, 1997; Gleeson, 1999). Accordingly, Gleeson (1999, 130) explains that ableism; while offering “the advantage of specifying people with impairments’ oppressive experiences with respect to other, well-known social cleavages, however, this very distinct term may also, in some discursive contexts, overemphasize the singularity of people with impairments’ identities and, in so doing, underestimate connections between disability and the broad currents of social oppression that arise from culture and the political economy.” This can be interpreted as while the term ableism stresses the recognition of disabilities, it runs the

risk of simultaneously overlooking the oppression suffered by other social classes, such as the poverty-stricken or the homeless, or the politically disempowered, or certain ethnic groups.

Concurrently, Bolt continues by demonstrating a concept relating to ableism, a concept he calls ocularcentrism. This perspective is illustrated repeatedly in language and in metaphor. A clear and concise account of ocularcentrism is given in Jay (1994), and Bolt (2005) introduces us to this perspective's widespread and somewhat flawed use in the vision context. Likewise, Bolt emphasizes the many contexts in which the word *blind* can be used, the resemblance between blindness and darkness is a case in point. According to Bolt, this is because the relationship accentuates the ocularcentric in that it takes the visual perspective as a measure by which all others are judged, and it can only be from the position of sighted people that darkness appears as blindness.

The ableism phase leads to the disablement phase. Bolt (2005) continues with how disableist and ableist terminology has changed from traditional phrasing in an attempt to make them more politically correct. Defining this modification terminological appropriation, the author sees this as sometimes encouraging psychosocial barriers, such as the titular level of a number of publications (*Fighting Blindness*, *Blind Apple user discussions*, *Deaf/Blind America*, etc.) and organizations (Royal National Institute of the Blind, Action for Blind People, American Foundation for the Blind, etc.). This so-called appropriation, according to Bolt, while representing a response to traditional biomedical terminology, can still be ableist, outmoded, and regressive.

Bolt (2005) shifts to a third phase in his proposed typology, the impairment phase. The impairment phase represents a shift to progressive discourse, and we see a contrast

from certain journal titles being indicative of psychosocial barriers as in phase two, the opposite can be said in phase three where publications show progressive terminology (*Visual Impairment Research, The British Journal of visual Impairment, The Journal of Visual Impairment and Blindness*, etc). Likewise, titular modification of publications seen in some periodicals signifies progress in disability terminology representative of moving beyond ableism, and Bolt sees this terminological shift, such as usage of the word *impaired* instead of *blind*, as recognition that people are not with, but frequently disability looks for them. To clarify, only while living in an ableist society, where thinking assumes visual acuity and impairment, will a person be disabled. Examples provided by Bolt include someone who arranges to meet friends for a meal is disabled if his or her guide dog is not allowed into the restaurant, or a person using a white cane for mobility purposes is disabled if he or she walks into the overhanging branches of an unkempt tree.

In his conclusion, Bolt (2005) produces further evidence that is representative of new medical geography ideas, arguing how the social model needs to be expanded. For instance, Bolt acknowledges that his proposed typology recognizes terminology agreeable with a continuum of visual impairment, ranging from unimpaired vision to complete absence of vision, and a recognizance of the continuity connecting these two extremes. This acknowledgement adheres to Chouinard (1997) stressing that disabilities are not stable and any attempt to lump them together is pointless, and Butler and Bowlby (1997) and the new medical geography in that it is important to identify commonalities among people. Furthermore, distinguishing commonalties between people with various degrees of impaired vision is an important aspect of the proposed typology and Bolt

views this as corresponding to postmodernist views that all of us are vulnerable to our own limitations.

2.6. Summary of Disability Literature

Disability literature began with traditional approaches representing a biomedical model perspective. As time passed, the biomedical model was criticized for ignoring social oppression, and the prevalent arguments in the accessibility and mobility literature began to concern the ways in which people with impairments were excluded in the construction of urban landscapes. Most recently however, the social model has come under criticism for denying the real pain, suffering, isolation, and exclusion that accompany disability. New medical geography recognizes these concrete characteristics and also different types and degrees of disability, and therefore identifies individual relevant services with respect to individual needs. The service provision literature centers on the on people with special needs and the services designed to assist them. A common theme is the service provision literature is the discharge of people with special needs from large-scale institutions into community-based care networks.

Literature on production of difference and personal experiences draw on social theory and represent the most recent approaches in the disability literature. Work in the production of difference area emphasizes the structures and terms that strengthen oppression and the exclusion of people with impairments. Production of difference is countered by the new medical geography theories, which criticizes the social model for its denial of the real limitations of people with impairments, and stresses commonalties. Common attributes of personal experiences literature include interpretations of relationships between people with impairments and their environments. This dissertation

investigated the interpretations of the relationship between people with sensory impairments and/or mobility impairment and natural hazards. In addition, my project identified differences in these relationships when compared to abler-bodied people.

2.7. Hazards and Disability

Hazards research in geography is not a stable discipline. In the past, hazards geography focused primarily on natural hazards research and risk analysis (Mitchell, 1989). To set this study in context, it is important to recognize that White (1988) has shown that natural-hazards research can be centered on human responses to geological, meteorological, and hydrological risks including earthquakes, tornadoes and floods. My project focused upon individuals from a certain vulnerable social group, people with sensory and mobility impairments, and their perceptions of alerts and reactions to severe meteorological events. Concurrently, in recent times, geographical hazards research paradigms have been extended to include complex threats such as hunger, warfare, and global environmental change (Mitchell, 1989). In this context, Mitchell points to

...the dichotomy between a unitary global perspective and fragmented local perspectives. This is especially interesting to geographers, because it touches on issues of scale and spatial organization. Thus, we inhabit “One Earth” whose physical systems are interdependent, but we live in “Many Worlds” that are fragmented into competitive groups by divisions of religion, language, class, ethnicity, and historical experience. It is evident that hazards must be considered in the context of several hierarchical spatial mosaics of socio-environmental conditions (Mitchell, 1989, 419).

Literature dealing directly with natural hazards and impairment is generally limited, and geographical work is particularly thin in this area. However, two studies by geographers are of particular note. Both investigate toxic releases and the populations affected. With that in mind, I turn then to a study employing multiple methods and data sets, Margai (2001) investigates the spatial dispersion and impact of accidental release of hazardous

materials on nearby populations. The author hypothesized that toxic substances influence disadvantaged social groups unequally as compared to the mainstream population.

Margai (2001) placed environmental data concerning hazardous substances accidental releases into an atmospheric dispersion model to learn whether harmful substances did indeed disproportionately affect special needs, or disadvantaged, social communities. The proposition proves to be correct, as the study strongly supports the notion that exposure from accidental releases of hazardous materials disproportionately settle on marginalized populations.

The results of the study conducted by Margai (2001), notably that releases of hazardous airborne substances disproportionately affect special needs groups, represent fundamental information for government and emergency management officials pertaining to a diverse realm of special needs populations in many ways, ranging from preparation of emergency evacuation to specific training of crisis personnel. Furthermore, Margai demonstrates the importance of communications during a disaster, and suggests that educational material be developed in more than one language.

Chakraborty and Armstrong (2001) conduct a study in Linn County, Iowa, and complement Margai (2001) when hypothesizing that releases of hazardous airborne substances disproportionately affect special needs groups, identified as the elderly and very young, wheelchair users and mobility difficulties, people with sensory impairments, people with cognitive impairments, those with heart problems, chronic illnesses patients, and people with terminal diseases. They anticipated that people with special needs reside within urban locations which are in close proximity to service providers assisting them. It follows that urbanized areas consisting of industrial facilities are susceptible to varying

sources of accidental hazardous material releases. In their study area, Chakraborty and Armstrong (2001) identify inequity in the spatial distribution of hazardous chemical releases as they impact upon populations with special needs, and their findings are likely to extend to metropolitan locations everywhere.

Chakraborty and Armstrong (2001) suggest special attention be given to people with special needs, notably those with mobility impairments and who will require evacuation assistance in the case of hazardous material deployment. These findings, coupled with the results of Margai (2001) complement those of Morello-Frosch (1997), who shows in a study of California counties that highly segregated areas, in terms of income, class, and race have higher levels of hazardous air pollution than non-segregated regions.

Despite Margai (2001) and Chakraborty and Armstrong (2001), existing literature tends to focus on service provision and access to warning systems. For example, Low and Babiak (1998) examine a center for independent living in Oklahoma, and gather data from personal interviews with people with hearing-impairments and weather officials, to discuss an ongoing project in Oklahoma aimed at improving the accessibility of severe weather warnings. Similarly, Wood and Weisman (2000) employ the results from questionnaires and mail surveys distributed to hearing-impaired persons in Oklahoma and Minnesota to explore the provisions that participants use to receive weather information, and then analyze participant complaints and problems in receiving weather information.

Following the 17 October, 1989 Loma Prieta earthquake disaster that severely shook the San Francisco and Monterey Bay regions of California (Nakata et al., 1999), the California Governor's Office of Emergency Services (OES) employed a consulting team to analyze disaster preparedness and concluded that traditional response systems failed to

take account of people with special needs (OES, 2000). The OES subsequently updated their protocol and the newer version urges emergency management to include community-based organizations (CBOs) that provide daily services to those most vulnerable to disasters.

In a latter article, Wood and Weisman (2003) update their findings with respect to new government policies and technologies created to increase the accessibility of severe weather warnings for people with impaired hearing. They conclude that, because of lack of education and assistive technologies, people suffering from hearing-impairment the study area in Oklahoma and Minnesota still have limited access to severe weather information, consequently further isolating people with impaired-hearing from significant weather information

Once again, people with impairments are not alone with regard to special needs groups in the context of severe weather vulnerability, as is demonstrated in a situation involving a day care center in Florida. In a project created by the Institute of Business and Home Safety in Tampa, and funded and organized by several Florida organizations, efforts by citizen volunteers and staff from a day care center are reducing children's vulnerability by making simple adjustments to secure objects (Steele, 2002). This project shows promise for future development, as project designers expect to lead by example and the hope is that day care centers and schools throughout the state of Florida will learn from their efforts.

However, as of yet no considerable progress is in the plans, according to the National Council on Disability (NCD). Despite the measures taken by the center in Tampa to strengthen the establishment from extreme weather events, the NCD in 2005 stated in a

personal communication with the author that “we have no information on the Florida story.” This is not good news given nearly five years have passed since the Tribune article, as an article published in the Tallahassee, Florida *Democrat* on April 17, 2005 titled “Disabled overlooked in emergency cases.”

Service provision in the severe weather realm continues to be developed, and in recent times we see more literature including human-initiated disasters alongside natural disaster preparedness. An example is an article published by the National Organization on Disability (Harris Interactive, 2004). In order to get an accurate measure of people with impairments’ preparedness strategies in the event of disaster, whether initiated by humans or by nature, the National Organization on Disability (NOD) hired Harris Interactive to devise a methodology that would investigate the procedures of emergency management personnel in the United States. Harris Interactive obliged by conducting a study involving emergency management officials and their techniques for including people with impairments. Likewise, the authors’ objectives encompass an understanding of the nature behind emergency plans for people with various impairments and their needs. Another objective in this study was to get an idea of how people with impairments and emergency personnel perceive the disaster resources at their disposal.

Harris Interactive’s (2004) survey included nearly 200 respondents. The methodology incorporated officials in charge of emergency preparedness for various sized metropolitan area jurisdictions throughout the United States. Telephone interviews were conducted in late August and early September, 2004.

Harris Interactive (2004) notes that survey results indicate that preparedness plans currently underway in most jurisdictions include necessary developments that will

account for the special needs of dependent individuals, and these emergency plans compensate for a diverse range of impairments and residential scales-private homes, home-based care networks, and institutional settings-as well as transportation for evacuation purposes. In addition, survey results reveal a significant extent of people with impairment's participation in the emergency planning process and public outreach programs. The most heavily cited emergency preparedness plan in operation that accommodates the special needs of dependent people was a full all-hazards plan-one that can be used in the event of a wide range of disasters.

Despite these promising activities, according to the study conducted by Harris Interactive (2004), Americans with special needs are unprepared for emergencies, and are nervous concerning their safety. Furthermore, inadequate funding for resources to accommodate people with special requirements in the event of an emergency was another concern of emergency management officials. Evidence exhibiting lack of resources is evident in the testimony of only half of the emergency officials who responded, admitting that they do not maintain a special needs registry for their jurisdiction. This lack of resources is compounded by the fact that study results reveal that less than half of emergency management officials claim they have actually activated a special needs emergency shelter (Harris Interactive, 2004).

Harris Interactive (2004) take note of three important areas where participants differ in their responses. These areas, loosely defined, are the degree of respondents' involvement in emergency planning development, the degree to which special training has been provided for emergency personnel, and whether or not actual activation of an emergency plan has taken place. These areas of disagreement suggest that additional

research is needed in regard to accommodating special needs people in the event of disaster. Thus, the Harris report recommends additional research is done in such disciplines as decision-making, policymaking, and disability studies, notably simply perceiving and understanding is not enough and that actually *doing* is the difference.

These concerns are justified in the outcome of the disastrous earthquake and resulting monster tsunami that struck several Indonesian countries in late December 2004. On March 27, 2005 the online newspaper version of the British Broadcasting Corporation (BBC) (British Broadcasting Corporation March 27, 2005) details the disastrous geologic event, which began on December 26, 2004 when an earthquake of 9.3 magnitude took place far out in the Indian Ocean, spawning a huge tsunami that killed over 200,000 people. Implications of this event on people with impairments and hazards can be seen in another BBC online article. The article states a leading international charity organization, Oxfam Confederation (Oxfam, 2005), as reporting the majority of international aid provided for disaster victims being distributed among affluent people rather than less fortunate people who were hit hardest by the event (British Broadcasting Corporation online, June 25, 2005; British Broadcasting Corporation online, June 26, 2005).

A well written account of the tsunami's impact provided by Torchia (date, source unknown) who describes the terrifying situation at a shelter for people with physical and mental impairments in Galle, Sri Lanka. The author relates direct observations given by the asylum caretaker who survived the event, as well as other witnesses. Startling accounts are narrated about tormented cries of helpless resident youngsters lying in their beds as rushing water rose up around them or their bed mattresses floating away with them still on it, while others struggled to grasp ceiling rafters to avoid the rising water.

These events are direct examples that represent the concerns listed in Harris Interactive (2004), notably, further research in the areas of decision-making, policymaking, and disability studies. Decision-making could investigate policymaking agendas that consider the aspects of impairment when constructing shelters. Accordingly, additional research in disaster management is one large interdisciplinary effort.

These concerns are further justified in the catastrophic aftermath and human devastation resulting from the hurricane that made landfall on the United States Gulf of Mexico coast in late August 2005. Hurricane Katrina churned through the Gulf of Mexico as a category 5 storm with maximum sustained winds of 175 miles per hour (National Weather Service National Hurricane Center Tropical Prediction Center Tropical Weather Summary-Hurricane Katrina, 2005 website) and a lowest central pressure of 920 millibars (National Climatic Data Center Summary of Hurricane Katrina website, 2005). It downgraded to a category 3 storm by the time it made landfall in New Orleans, but nevertheless resulted in more than 1,000 fatalities and displaced hundreds of thousands of people.

The impacts of Hurricane Katrina on people with special needs were considerable. The National Coalition for Disability Rights (NCDR) (2005) reports the executive director of the National Association of County and City Health Officials as stating there is no recent precedent for preparation for an event of this magnitude or providing aid to a large disabled population such as the one affected in the event. In addition, the NCDR (2005) reports pharmacists as stating large numbers of people with advanced impairments have been injured and displaced by this disaster, and will likely have their impairments worsen because of delayed medical attention and separation from the medications they

rely on daily. Furthermore, the NCDR details testimony of people with impairments listed in several national newspapers, people with impairments who were victimized during the storm relate being cut off from supplies when the hospital or group home in which they reside was destroyed, people in wheelchairs being rescued from flooded areas and then being dropped in a flood-prone spot with no food or water, wheelchair users being left on their own to fend for themselves in flooded areas, and lack of necessary evacuation means for people with certain impairments such as amputees, those with prosthetic limbs and people strapped to gurneys with IVs attached to them. These circumstances are compounded by the fact that health networks in the affected cities are in need of serious reconstruction and damaged beyond repair. Accordingly, the vice president of the national hospital accreditation organization is quoted as acknowledging the poor circumstances of regional medical centers, and relates the horrifying story of “how doctors and nurses felt compelled — against the fundamentals of their training — to make triage-style choices during the flood. They -were forced to aid some patients at the expense of others with less chance of survival” (Crary, 1, 2005). Likewise, the disturbing details of people with impairments being injected with excessive amounts of morphine and abandoned, as hospital personnel evacuated, is emotionally narrated in NewsMax.com (NewsMax.com, September 12, 2005).

Physical aspects alone cannot provide a complete understanding of the un-naturalness of hazards; human components must also be scrutinized. It is no immediate surprise then that Rydin (2006) urges for a subjective investigation of hurricane Katrina, the spatial analysis of socio-economic, cultural, and political characteristics of the disaster, and suggests human geography as the ideal discipline for such an investigation. Rydin,

believes a geographical analysis would reveal important social patterns within the city and surrounding areas relevant to understanding social and economic and cultural impacts, the 'Many Worlds' concept comes into play here as Rydin argues for an analysis of Hurricane Katrina expressed in the Mitchell (1989) passage at the beginning of this dissertation (stated below for the reader's convenience). Likewise, Rydin points to the urban and social segregation made evident by international media coverage and political reaction in the handling of the disaster, including emergency management and its preparedness in handling of vulnerable groups.

We inhabit "One Earth" whose physical systems are interdependent, but we also live in "Many Worlds" that are fragmented into competitive groups by divisions of religion, class, language, ethnicity, and historical experiences. It should be evident that hazards must be considered in the context of several hierarchical spatial mosaics of socio-economic conditions (Mitchell, 1989, 419).

There are many characteristics of disasters representative of the 'Many Worlds' involved in the fragmentation of social class 'into competitive groups by divisions of religion, class, language, ethnicity, and historical experiences; and Rydin (2006) is asking how a geographical approach to hazards can explain these things. A radical approach would emphasize these attributes and bring them to our attention. Rydin provides many questions of social, political, economic, and cultural importance in determining why vulnerable populations suffered more than others. For instance, how and why did the economic base of Katrina's impact site come to occupy such a vulnerable location, thereby locating a large city in harm's way? Did the globalization-influenced advantage of location outweigh human life? And, what of the federal government's involvement in overseas controversies influence on local urban politics and risk management? It is interesting that the author, in the context of vulnerable groups in the city, asks if social

capital, a concept clarified in this context by Woolcock, (1998) and later Klinenberg (2002), was present in the impact area before, during and after the event. Indeed, regarding social capital, Woolcock explains that:

The vast majority of people, moreover, live, work, vote, pray, and recreate as members of various but distinct social groups that shape one's very identity, values, and priorities... and provides ...access to key professional networks, political insiders, and cultural elites; it is also the context in which one gives and receives care, friendship, encouragement, and moral support (Woolcock, 1998, 154-155).

Social capital implies ethical considerations and a person's moral obligation to help other less fortunate persons. Rydin examines ethical questions concerning Katrina, again suggesting a geographical analysis is the means by which an understanding of ethical issues can be learned. She offers inquiries of ethical importance such as 'how could people allow this to happen, and more generally, how could the federal government not make equal distribution of aid a top priority? However, according to Rydin a simple geographical analysis that maps and explains spatial distributions of power, greed, corruption and general inequalities is inefficient to completely understand the ethics of hazards. Rydin goes on to state an ethical understanding in the context of the disaster involves recognizing the allocation and perception of rights and responsibilities influencing decision-making regarding emergency management and distribution of aid.

Accordingly, Rydin (2006) points to the environmental justice literature (Agyeman et al., 2003a, for instance) as an example of an ethical investigation of environmental justice research. Likewise, she demonstrates how environmental justice scholarship first was concerned with the spatial inequalities in the location of environmental risk to human well-being associated with the likes of toxic wastes sites, polluting industrial sites, incinerators, and heavily traveled highways. But now we see the environmental justice

literature moving beyond these concerns and focusing on ethical issues like responsibility for social and environmental consequences not only for the incident itself, but management of affected areas in the future. It is curious that people with impairments are not mentioned in this body of literature, especially now that academic disciplines such as Feminism (Dyck, 1999), Anthropology (Kasnitz, 2006), and Medical Geography (Curtis et al., 2006) are becoming more aware of this particular social group and including them in their research.

This is not to criticize or condemn the environmental justice literature in any way, just to suggest a relationship between environmental justice research and a disability approach to natural hazards research, notably the literature I have cited in this dissertation. The differences between natural hazards/disasters such as tornados and/or earthquakes and human-induced environmental injustices and disaster like the Bhopal disaster in 1984 at an industrial site in India should be recognized. The Bhopal event sparked accusations of environmental racism (Bhopal Information Center, 2001). This identification of similar dialogues in the two academic disciplines does not end here, but goes much further and calls for a brief discussion.

I wish to expand on an area of environmental justice literature and broaden it a bit to include an infrequently spoken about social group in the environmental justice literature, people with special needs. This particular assemblage meets many social characteristics of those who are disadvantaged and *selectively victimized* (Agyeman et al., 2003b) to the greatest degree by uneven distributions of environmental misfortune. Accordingly, Cutter (1995, page 113) acknowledges the expansiveness of the contemporary environmental justice context, and writes “environmental justice ... moves beyond

racism to include others (regardless of race or ethnicity) who are deprived of their environmental rights, such as women, children, and the poor.” Environmental justice terminology with respect to marginalized social groups is strikingly similar to that of disability studies dialogue. I list examples in the following paragraphs.

Parallels between the environmental justice and disability discourses are worth pointing out. For instance, the former constantly speaks of the disproportional distribution of environmental ‘bads’ upon those at the bottom of the socio-economic ladder (for a selection of writings on this topic refer to Agyeman et al., (2003a), so too does the latter as it links people with impairments with other marginalized social groups (see for example Dear and Wolch, 1997 or Race et al., 2005). We also see comparable discussions of exclusionary measures. For example Dunion and Scandrett (2003) show exclusion with regard to environmental justice by doing several case studies in Scotland that not only reveal exclusion but also demonstrate how environmental injustices more often than not occur at a local scale and in communities with a history of exclusion from planning processes. And, Cutter (1995) reflects that a relevant case should be made for accessibility being made a civil right, agreeing with Agyeman (2003a), who notes multiple studies expressing a link between environmental exclusion and social exclusion (a common attribute of disability). In the realm of disability studies, exclusionary measures have been identified frequently. For instance, the accessibility and mobility writing argues that the construction of urban landscapes and their exclusionary barriers (Vujakovic and Matthews, 1994; Imrie, 1999a; Imrie, 1999b; Kitchin and Law, 2000; Edwards, 2001).

Issues of space, time, and vulnerability deserve special prominence. Accordingly, the disability literature is very broad in this subject, ranging from urban congested spaces providing service provision (Dear and Wolch, 1987), who discuss deinstitutionalization and reintegration into urban areas; Gerber and Kirchner (2003) who a focus on priority for living spaces; Hahn (2003), who examines physical barriers and public space; the relationships expressed in the process of disablement centered around time, space, and place highlighted in (Driedger et al., 2004) to spatial languages noted in Golledge (2005).

In congruence with the disability discourse follow the environmental justice terminology. For instance, Steinberg (2000) clarifies natural disasters and link them congregated extra-vulnerable groups, and Klinenberg, (2002) who discusses links between urban segregation, ghettoization, and vulnerability to extreme weather events. These discourses are associated with the radical aspects of hazards by Agyeman et al., (2003a), who note that at diverse scales, scholars are found doing research on social and environmental justice; and Pulido (2006), who validates a close linkage between disempowered and disenfranchised social assemblages (people with impairments included) and their vulnerability to natural or human-induced hazards.

One last parallel between the environmental justice and disability literatures concerns the quote noted in the above paragraph by Cutter (1995, page 113) that acknowledges the expansiveness of the contemporary environmental justice context, and involves civil and human rights. There is a strong linkage between environmental justice and the Americans with Disabilities Act of 1990. Accordingly, Gleeson (1997) links the disability literature with social justice issues, and Kitchin and Law (2001) use their human rights framework to link disability to human rights, and Golledge (2005) confirms

the potential of the Americans with Disabilities Act to mean civil rights for people with impairments. In addition, in the social justice context Alabi (2003, page 281) writes “environmental injustice, which emanates from disproportionate environmental degradation...also violates the basic principles of equity, fair play and social justice.” This concurs with Agyeman et al. (2003b, who notes that the formation of environmental justice policy, at all levels, which reflects a nurturing association between mainstream environmental justice movements...and minority groups concerned with civil rights. Furthermore, the links with Civil Rights and the Americans with Disabilities Act are acknowledged by Bullard (2006), a prominent scholar of environmental justice and author of multiple journal articles and books. The parallels in my discussion are just a partial list and any interests in these discourses are encouraged to further explore the literatures in disability studies and environmental justice scholarship.

Environmental justice scholarship demonstrates minority groups using their marginal status to influence public policy. Likewise, Klinenberg (2002) reported similar actions. Klinenberg relates how lobbying by senior citizens and other marginalized and disempowered groups resulted in policy alterations being made in Chicago regarding disaster management, preparedness, and environmental extremes, following an extreme weather-related incident in 1995. Eady (2003) reports several instances at the state level of environmental activists influencing policy, notably in the state of Massachusetts. Further, Agyeman et al., (2003b) continue this discussion, and comment on the establishment of an Environmental Protection Agency Office of Environmental Justice and other federal organizations directing ecological issues, and reflect on the reality of environmental justice, among other plans for justice, influencing political policy at a

global level. A somewhat parallel situation exists in regard to Central America, and a brief discussion follows.

The *Democrat* article notes that emergency plans often disregards people with impairments. Leaving dependent populations out of emergency planning increases their vulnerability and marginalizes them by withholding potential life-saving information (McDonough, 2005). Moreover, McDonough reports on findings by the National Council on Disability, which investigated past natural and manmade disasters, including the energy blackouts in the Northeast and Midwest, wildfires in the West, hurricanes in Florida, and the September 11, 2001 attacks on the Twin Towers in New York and the Pentagon in Virginia, and found weaknesses in evacuation plans that left people with impairments vulnerable. According to a NCD research specialists (Gould, 2005), emergency plans with respect to people with impairments should identify who the people are, their location, and each person's special evacuation needs. Information such as this will waste valuable time and should not have to be made during the emergency. The report concludes, however, that the events of September 11, 2001 have not resulted in change and/or innovation related to disaster preparation for all individuals.

An example of important information not reaching people with impairments is given in the *Democrat* article (McDonough, 2005). The article reports that during the 2003 California wild-fires, people with hearing impairments were unable to distinguish evacuation announcements distributed by emergency vehicles on the streets from standard street sounds. Concurrently, lack of closed-captioning for the hearing impaired on television warnings meant many hearing impaired viewers were unaware they were in danger, placing them in a precarious and potentially life-threatening situation. Strikingly

parallel circumstances exist with respect to the author of this dissertation, as televised severe weather warnings are not closed-captioned on all television stations. Personal correspondence (Dutton, 2001) with Vice President of Operations & Engineering for NEWS 9 Oklahoma City revealed closed-captioning of severe weather alerts has proven questionable at best. Federal Communications Commission (2004) section on Accessibility of Emergency Information requires that:

Any information that is intended to further the protection of life, health, safety, or property, such as immediate weather situations, civil disorders, evacuation orders, school closings, relief assistance, etc., be accessible to persons with disabilities. These rules apply to all local broadcasters, cable operators, and satellite television services. There are no exemptions to these rules and they apply any time emergency information is provided. Critical details about the emergency must be provided in a visual format, such as open captions, scrolls, or even hand-lettered signs. The critical details must also be provided in an aural format (Federal Communications Commission, 2004).

Given these regulations, it appears to advocates supporting closed-captioned weather alerts, that efforts by NEWS 9 since 2001 to “place critical emergency information in text form on top of the screen that gives the pertinent information for emergency situations” are commendable “but only if their visually displayed alert information matches exactly their spoken information” (Schulman, personnel communication, 2005). Recent personal communications between the author of this dissertation and the Program Director at NEWS 9 demonstrate the television station’s commitment to provide accessible severe weather alerts that do not violate FCC and ADA regulations. Still, the fact remains that NEWS 9 does not implement real-time closed captioning in their weather alerts, but instead “portray weather forecast information but it will not be verbatim from the weathercasters, it will be information from the National Weather Service” (Eubank, 2005). This technique appears to be accessible and should get the relevant information to

persons with hearing impairments. Whether or not pertinent information reaches hearing-impaired people who are also vision-impaired is another story however.

According to advocates, while the critical emergency information displayed in text form, while also accompanied by graphical data portrayed on maps, too much conversational information is spoken for people with hearing-impairments to perceive. As a result, “matches exactly their spoken” does not happen. NEWS 9 continues to select this money-saving technique instead of keeping a transcriptionist on call at all times who can provide closed-captioning of severe weather alerts in real time, and advocates believe this could put lives in jeopardy.

Another theme in hazards and disability literature is response and vulnerability with respect to a given weather event. An example of this is Biddle (2000), who conducted interviews with people living or working in a disaster area. Biddle, a geographer, concluded that fatalities following the May 3, 1999 Oklahoma City tornado outbreak were concentrated among the elderly, poor, disabled, and less educated. Another example is Rahimi (1993), who offers an engineering perspective and gathers data through personal interviews with people with physical impairments experiencing the October 17, 1989 Loma Prieta earthquake. His conclusions show that response during the event is comparable to non-disabled people experiencing the same event, emphasizing the of responses rather than any significant differences between disabled and able-bodied.

2.8. Bringing the Literatures Together

This project investigated the personal experiences of people with sensory/mobility impairments in the context of severe weather events. Particular interest lies in the

personal experiences of participants when severe weather threatens, and their preparation for, and response to, weather events. With the single exception of Chakraborty et al., (2001), the geography literature is marked by the absence of work on this topic. Yet the strategies used by participants taking part in this study have a very clear geographical component. Geography matters at a variety of geographic scales – from the micro-scale of the residence involving ways in which individuals secure access to warnings and take evasive action in the event of severe weather- to the macro-scale involving protective shelter at varying distances from the home. The location of respondents within a broader geographical community is also likely to be significant in determining how they experience and confront severe weather. Other scholars have explored the general issue of ‘vulnerable populations’ and severe weather events, for example Steinberg (2000) from a historical viewpoint and Klinenberg (2002) from the perspective of a sociologist, but neither focus specifically on people with impairments. What follows is a re-examination of the disability literature showing how each stream might address the problem of disability and severe weather events.

2.8.1. Accessibility/Mobility

An obvious theme when relating the accessibility literature to natural hazards are issues of access to shelters and protective spaces. Service provision debates may then arise on whether or not community-based care networks can or should provide accessible storm shelters. As noted by Vujakovic and Matthews (1994) and also by Imrie (1999), if people with mobility impairments were included in urban landscape design and development then perhaps storm shelters and transportation to these shelters would be

made more accessible. Access and mobility in relation to the threat of severe weather have a clear geographical component.

2.8.2. Service Provision

Dear and Wolch (1987) show that success of the deinstitutionalization process is always place specific. Further, results of deinstitutionalization in the hazards framework are a function of whether or not community-based care networks are well developed and favorably located. Where such care systems provide certain degrees of independence and social interaction, chances are that dependent people will have access to severe weather alerts, and also to friends or care workers who see to their safety. However, when deinstitutionalization is unsuccessful and discharges dependant individuals into the streets where no community-based care network exists and/or the NIMBY (Klinenberg, 2002) process prevents community-based care facilities from developing, former institutional occupants are much less likely to be protected from natural hazards.

2.8.3. Production of Difference

When translating production of difference approaches into a hazards context, an increase in vulnerability can be seen to materialize on the part of dependant people. An example is the barriered and bounded spaces in closed cities, which indicate inaccessibility and exclusion from storm shelters. Categorization of people into groups, such as abled/disabled, repeatedly produces difference as people become divided (Sibley, 2001). The point here is that when differences are emphasized, vulnerability of dependent people to severe weather events is magnified.

2.8.4. Personal Experiences

The primary focus of work in the personal experiences tradition has been on everyday life experiences, with a view to identifying ways in which individuals negotiate their impairment both socially and spatially. Much of this work has focused on mundane or ‘ordinary’ activities around work and social life more broadly. The context of severe weather events provides a very different emphasis, one that focuses on personal experiences in situations that are defined by their exceptional nature. Work in this tradition would examine how disabled individuals deal with severe weather events. How does the nature of an individual’s impairment influence their response to the threat and realization of severe weather? For example, an individual with a hearing impairment is likely to structure his/her reactions and responses around visual alerts (Wood and Weisman, 2000, 2003; Low and Babiak, 1998). Social networks are essential for mobility-impaired individuals in their response and reaction to severe environmental events, notably via evacuation procedures (Chakraborty et al., 2001). How do impaired individuals negotiate the threat of severe weather, and to what extent do exceptional weather events serve to marginalize or alternatively integrate people with special needs?

When we look at all four approaches within the disability literature and place them in a hazards context, it is clear that these four approaches all support the view that effects of ‘natural’ hazards are not uniform across all social groups. An interest in hazards and severe weather events leads to an interest in the experiences of people with impairments in terms of preparing for and responding to said events. Accordingly, the context for this study is one of an interest in everyday experiences of people with sensory and mobility impairments and what these everyday experiences tell us about the people with impairments and their position within contemporary society.

3. RESEARCH PROBLEM AND METHODOLOGY

This dissertation examined the personal experiences of people with sensory and/or mobility impairments when severe weather threatened. I pursued this objective from several directions. The research questions that I asked were intended to fill in a number of gaps in the geographical literature on disability. My primary research question asked how people with sensory impairments become aware of severe weather alerts, and how people with mobility impairments respond to evacuation needs. This question centered the research firmly within the personal experiences tradition, and would expose any subjugation experienced by participants due to inaccessible warning systems and inaccessible storm shelters. My secondary research questions included: 1. how did participants with sensory impairments adapt to not being able to perceive severe weather threats, 2. how mobility impairment effects preparation for evacuation necessities given inaccessible shelters, 3. how preparation for, and response to, alerts indicated adaptive strategies and social networking/broader community links, 4. how commonalities among participants (in terms of becoming aware, and response (evacuation), or variations (with impairment) identified difference, and thus vulnerability, and how this vulnerability was explained and mitigated, and 5. how storm shelters effected the experiences of participants? Together, these questions contributed to all four of Gleeson's disability sub-streams.

Questions regarding emergency shelters involved scale, and this can be seen with respect to distances between shelters and residences. The discussions radiating from the secondary questions linked them with the primary research objective. Together, the

secondary research questions revealed how participants experienced severe weather alerts by examining how they perceive and then react to such events.

In examining natural hazards, it should be recognized that people with impairments belong with other marginalized social groups. The way in which alerts were obstructed by inaccessible warning devices made participants with sensory impairment inconvenienced. In a similar matter, inaccessible emergency shelters placed the mobility impaired participant in a disadvantaged position. As Blaikie et al. (1994) point out, disasters are not merely caused by extreme natural events, but are the product of social, political, and economic processes, and the direct influences these circumstances have on people. The experiences of my study participants resemble the attributes listed in Blaikie et al. The resemblance is most visible when assistive technology is absent from warning systems, and shelters are inaccessible. In addition, an absence of social networks represents isolation and vulnerability. Burton (1978) and Cutter (2000) both attribute reduction to hazards vulnerability to social networking.

In order to address my research questions, a two-pronged qualitative methodology was used, using research diaries compiled by participants and semi-structured interviews. Research diaries and in-depth interview methods were used for a number of reasons. Specifically, research diaries provide data that can be as accurate as those data gathered through direct observation (Zimmerman and Wieder, 1977; Elliott, 1997; Latham, 2003; Meth, 2003). The strength of the method in this context lies in the role of diaries as both a recorder of, and reflection on, personal experiences. Its value is as a means of understanding the taken for granted, or that which commonly lies at the back of people's minds (Elliott 1997).

Eyles and Smith (1988) state that qualitative (or interpretative) geographical methods seek to understand and explain the nature of social reality as perceived by study participants, and to understand the rationality and reasoning of individuals in specific contexts. However, Hine and Mitchell (2001) argue that work based on quantitative methods that seek to gather observable and/or measurable data, commonly fails to address the complexities of disablement.

Crang (2005) discusses qualitative methods in geography, and notes that such methods have an interest in the body and emotions. He notes a common debate between scholars wanting to preserve traditional, often rugged fieldwork involving direct observation, and those choosing to gather their data through multisite ethnography “paradoxically qualitative but locationally pluralistic and methodically uniform” methods such as e-mail interviews and telephone interviews (Crang, 2005, 229). I believe such “paradoxically qualitative” methods are justified in cases when the researcher’s corporeality prevents the use of traditional fieldwork.

The method used in this study is termed the Diary: Diary-Interview Method by Zimmerman and Wieder (1977). Not only does this method provide data approximate to that gathered through direct observation, it also enables the researcher to gather data unavailable to on-the-spot observers, most notably the reasoning behind individual behavior. Zimmerman and Wieder note that during diary-based interviews, questions can be asked about:

...diarists’ feelings about the events they reported, their feelings about the other participants in those events, their sense for alternatives which were actually or potentially available to them as courses of action, how they choose one course of action over another, the consequences, especially social consequences, of choosing one course of action over another (and in this way uncovering

sanctionable structures), and their sense for the typical flow of events (Zimmerman and Wieder, 1977, 492).

The diary: diary-interview method has been credited as a solution for preserving the often harsh conditions of traditional fieldwork, such as when direct observation must be in difficult and hard-to-reach environments (Zimmerman and Wieder, 1977). This method reshapes geographical qualitative techniques in that it produces data approximate to information collected through direct observation (Zimmerman and Wieder, 1977; Elliott, 1997; Latham, 2003; Meth, 2003). It is multi-scaled and translocal in that some of the participants selected reside in apartments, and others in private homes, two qualities noted by Crang (2005) as necessary in satisfying the debate discussed in the above paragraph. And, acknowledging Elliot's (1997) retrospective censorship (next paragraph), Crang interprets this as allowing informants an easier path for expressing themselves emotionally. In addition, Crang examines issues of silences, also noted in the work of Elliot (1997), Meth (2003), and Latham (2003), and how they might reflect fundamental importance.

Furthermore, the diary: diary-interview method has the potential to elicit the reasoning behind a subject's choosing one alternative over another, in that the combination of diary and diary-based interviews offers informants different ways for them to express these feelings and what is important to them in the contexts identified by the researcher (Elliott 1997). Meth (2003) notes the temporal nature of diaries and their potential to provide alternative accounts and diverse ranges of thoughts. Elliott (1997) references the notion of retrospective censorship, meaning that problems with remembering are less likely to occur because diaries are often written in the present as events occur.

Another advantage to the diary: diary interview method is that individuals sometimes have difficulty expressing emotions verbally, and diaries provide a more comfortable way for them to express these feelings. As Elliott (1999) states, as a research method the diary: diary interview method is valuable in accessing accounts which are otherwise 'hidden' or 'muted' – that is, accounts that do not fit readily into the research context, or are difficult to admit to. Meth (2003) also speaks of the cognitive space where diarists' reveal stories about difficult to divulge emotions. For Latham (2003), the diary: diary-interview method represents a research method that accesses routine, cognitive, and corporeal data, and the actions that they form as research subjects can find a space for reflecting upon mental, nonverbal practices. However, diarists were aware that I would read their diaries, and this recognition might have affected what was written by the diarists.

In-depth interviews as part of the diary: diary-interview method also served as a means for investigating personal experiences. Morgan (1997) states that personal interviews are advantageous when seeking an in-depth understanding of people's experiences, and notes that the close communication with participants in personal interviews allows the researcher to control the information being discussed. Steidman (1991) stresses the important role language plays in learning and understanding participants' experiences through the stories they share with their speech, thought, and symbolism. Steidman also advocates in-depth interviewing as a qualitative method due to its ability to provide an understanding of the context of an individual's behavior and thereby a way of understanding the meaning of that behavior.

According to Dyck (1999), in-depth interviews reveal an individual's relationship to her or his environment, and the role of impairment in structuring that relationship. Semi-structured, informal interviewing allows a variety of topics to be covered in a flexible fashion while following the lead provided by the interviewee. Hine and Mitchell (2001) argue that topics of interest when researching people with impairments, such as accessibility and mobility, are best gathered using qualitative methods that record personal accounts and experiences.

In order to select a time frame in which to conduct the research, it was necessary for me to learn when severe weather most often occurred in the study area. Accordingly, the National Weather Service Verification and Storm Data Severe Weather Warning Interactive Database (NWSVSDSWID) was consulted. And, according to the NWSVSDSWID, the greatest frequency of severe weather warnings in Cleveland County, Oklahoma for the two decades from 1982 to 2002 occurred during the period from late March through the end of July. Therefore, a period was selected to coincide with a seasonal time span when severe weather was known to be most common to the study area. Despite a time delay in receiving approval from the Institutional Review Board (IRB) to begin fieldwork, diarists were asked to record their responses to severe weather watches, warnings and events over a period as close to these dates as possible. Specifically, a ten-week period beginning July 1, 2005 and ending September 9, 2005 was selected. Insufficient data resulted in the diary period being expanded to include the fourteen-week period beginning July 24, 2006 and ending October 30, 2006 in order to generate additional data. The research diaries were then collected and used as a basis for interviews with the diarists. The diaries served as a question-generating device as diarists

elaborated and clarified entries via follow-up interviews. The diary-interview also served to verify diary accounts.

Recruiting individuals for the project required careful consideration as to which impairments would be targeted, as well as the ethical considerations in conducting research with people with impairments. Permission to conduct this research through the Diary: The Diary Interview Method was granted by the OU IRB, including the necessary time period extension and small number of research participants. The project focused on individuals with hearing impairments individuals with vision impairments. Mobility impairments, which bear more heavily on the questions of evacuation procedures and evasion, were also considered. The goal here was not to seek a strictly representative sample of the special needs population, but rather to gather a range of experiences across people with different degrees and forms of impairment.

Twenty-two individuals were originally recruited to act as diarists. The group included twelve individuals with sensory impairments (ten hearing-impaired and two vision-impaired; two of these individuals had both hearing and vision difficulties), five individuals with mobility impairments, and five individuals who were 'able-bodied'. The latter group served as a control to allow comparison between individuals with impairments and those without. However, seven of the participants with sensory impairments (six-hearing impaired, and one vision-impaired) withdrew from the study

TABLE 3.1

disabled participants (pseudonym)	Impairment	age	residence type
Lane	hearing	51	private
Marie	hearing	34	private
Ned	hearing/vision	34	private
Randy	mobility	60	private
Tom	hearing/vision	45	private

able-bodied participants (pseudonym)	impairment	age	Residence type
Dan	N/A	21	private
Rachelle	N/A	23	private
Will	N/A	44	apartment

Table 3.1 Research Participant Profiles

shortly after it began, and four of the participants with mobility-impairments also withdrew from the study. The reasons for withdrawal ranged from illness in the family or to the participant himself/herself, to computer problems, to no reason at all.

Of the four remaining sensory-impaired diarists, each was Caucasian. All four were hearing-impaired. Three were male, and one was female. All four hearing-impaired diarists resided in private homes. Two of the males had both vision and hearing impairments. The participant with restricted mobility was a male Caucasian. He lived in a private residence.

The three remaining able-bodied individuals included two males and one female. Each was Caucasian. One male and one female resided in private homes. One of the males lived in an apartment. The use of five individuals, although a rather small sample size, allowed for examination of a range of impairments and settings while allowing for

sufficient in-depth analysis, to probe fully the experiential aspects of dealing with severe weather events and threats.

One sensory-impaired diarist was Marie. She lived in Moore, Oklahoma in Cleveland County. She was 35 years old, and profoundly deaf. Marie wears two hearing aids. She is married, and has a two year old daughter.

Tom, another sensory-impaired diarist, was 45 years old. He lived in Norman, Cleveland County, Oklahoma. Tom has a hearing loss, but does not wear hearing aids. However, Tom does wear glasses. He is married and had a 16 year old son.

Ned, a 35 year old sensory-impaired diarist, also lived in Norman. He is hearing and vision-impaired, wears two hearing aids and prescription eye-glasses. Ned is married and has a one year old son.

Lane was a 51 year old sensory-impaired diarist. He wears one hearing aid. Lane was married with no children. Sulphur, Murray County, Oklahoma was his place of residence, where he had a private home.

Randy, a 60 year old mobility-impaired diarist, lives alone in a private home. He lived in Norman. Randy had open heart surgery in 2003, and the procedure left him with restricted mobility. He could only walk 20-25 feet, and for anything more than that, he used an electric mobility scooter. Randy was divorced and had an adult daughter.

The able-bodied diarists included three individuals. One was Will, a 44 year-old white male who lived in an apartment in Norman. He was single with no children during the project.

Two additional able-bodied diarists were Dan, who was a 24 year old white male. He lived in a private home in Noble, Cleveland County, Oklahoma. Dan was single and had

no children. The final able-bodied diarist was Rachelle. She was 22 at the time of the study. Rachelle resided in a private home in Norman. Like Will and Dan, Rachelle was single and had no children. Table 3.1 on page 86 is a profile of the research participants.

It must be recognized that the individuals who participated in the study may not be representative of the larger population with impairments because they represent a very small sample size. Therefore, the results should be generalized only with extreme caution. Parallels with Heyman et al. (2004) were apparent here in the small sample size. The principal source for diarists was people with personal relationships to the researcher, and the study was limited to participants aged 20 and over. This method of associated recruiting helps to address some of the ethical questions associated with researching people with impairments.

The ethical questions raised by this research methodology include those that pertain more generally to qualitative diary-interview based work, as well a more specific set of concerns centering on working with individuals with impairments. Participation in the study was entirely voluntary, and participants were free to withdraw from the study at any point. Participants were not identified in written output by name or by any other means. All participants were sent a completed copy of their interview transcripts to check the veracity of the transcript. Original diary materials were returned to participants at the conclusion of the study.

Additional factors had to be addressed during diary entry and diary interview transcription analysis. For instance, Zimmerman and Wieder (1977) note that diary analysis is often “read in terms of expected events which did not occur” (1977, 492). It was expected that the diary interviews would serve as a means to expand on thoughts,

perceptions, attitudes, and beliefs, omitted during diary recordings. During the diary interview the researcher must be prepared as best possible to handle unexpected information that may alter data analysis. Indeed as Zimmerman and Wieder indicate, “some answers could modify or even radically alter expectations. Thus, the diary: diary interview is, in part, a continuous process of challenging and refining the researcher’s conceptions” (1977, 493).

Elliot (1997, 8) lists five key response modes common to unstructured diary recordings. Accordingly, the weather diaries were analyzed to see if these five response modes were observable. Following this procedure, the diaries were analyzed again for a chronological record of experiences.

Diary entries and transcriptions from the diary interview were analyzed for a chronological record of experiences, as suggested by Zimmerman and Wieder (1977). A chronological record of experiences looks for indicators such as ‘who’ the diarist interacted with during the event; ‘what’ they did – in the form of a description of activities and discussions; ‘where’ – in the sense of the location of the activity and the movement of individuals within space; ‘how’ – involving a description of whatever organizational actions were entailed by the activity; and ‘when’, a reference to the time and timing of the activity with special attention to the actual sequence of events. Special attention was given to the diarists’ choice of alternatives, and why certain choices were made instead of others as well as the consequences of these choices.

A chronological analysis of informants’ personal experiences clearly demonstrated that inaccessible warnings and shelters placed Group A in an oppressive state. “Many worlds were visible in this research when comparison between Groups A and B revealed

a fragmentation of the two groups when the 'difference' was found to exist. Sensory-impaired informants compensated for their differences by forming social networks, thereby reducing their 'difference.' The informant with a mobility-impairment only had partial access to social networks, and so found himself vulnerable.

4. ANALYSIS AND DISCUSSION

For organizational purposes, the diarists were placed into two groups. Group A included participants with impairments and Group B included participants without impairments. As discussed in Chapter 3, each diarist was given a pseudonym, and is referred to individually by this pseudonym.

Diaries were unstructured, although guidance was given at the beginning of the diary period to what diarists might include in their entries. I specifically asked my participants to emphasize their perceptions, complaints, evaluations, and attitudes on severe weather alerts (Zimmerman and Wieder, 1977). I tried to make clear that I was not asking participants to keep “intimate journals” (Madge, 1065, 83) that people keep for their own private purposes, but to record over the time period listed in Chapter 3 their experiences with severe weather alerts. Specific instructions were given for diarists to record chronological attributes, characteristics such as who, what, where, how, and when (Zimmerman and Wieder, 1977, 484) (discussed further in the following paragraphs). In addition, a sample diary entry was distributed to each participant, and I asked each one to report the identity of other people involved in their experiences by relationship to them, such as ‘brother’ or ‘friend’. My participants followed the instructions to a certain degree. For example, I kept a file with a record of all severe weather alerts and warnings, and checked each diary to verify that entries corresponded with the recordings in my file. Although I kept from giving advance notice to the diarist whenever I received an alert, I expected my participants to record their experiences whenever an alert came into effect. I was wrong in this respect however, and my expectations were not fully met. Most of the

diary entries were anecdotal in nature, and recorded past experiences. This turned out to be best, however, due to the lack of storm activity during the study period, and I was able to analyze the data appropriately. Diaries were submitted to me through electronic mail, and not handwritten. I specifically instructed my participants to type their entries because I personally have trouble reading handwriting. Each diarist approached diary-keeping differently. Elliot (1997, 8) lists five key response modes common to unstructured diary recordings, and each were visible in this study:

- the potential of the ‘diary-interview’ method to accommodate different response modes;
- the extent to which the method captured diarists’ own priorities;
- the importance of the research process in illuminating the contexts within which helpseeking took place;
- the role of diaries as both a record of and reflection on the experience of (in the context of the study); and
- the value of the ‘diary-interview’ method as a means of understanding what is ‘taken for granted’ in accounts of (contextual phrase added) severe weather perception and response.

The different attitudes and styles were apparent in participant writing. For instance, a balance between reflection on past events and more straightforward reporting of events as they occurred were noticeable in both disabled and non-disabled diarists. One impaired participant wrote:

I had open heart surgery about one and a half years ago and it stressed out my lungs and I have difficulty walking and breathing. I am on oxygen all of the time and can only walk about 20 feet. I use a scooter. (Randy, diary)

and August 7, 2005:

It is now 6:15 Saturday evening. It has started getting dark outside with some light rain. I decided that I should turn on the TV to check the weather reports. Sure enough, heavy storms were in the area. It looks like I will have a long night ahead worrying about my breathing machine. (Randy, diary)

One able-bodied diarist wrote:

When I was about 17, I watched a tornado drop from the clouds about 5 miles west of where we were practicing soccer. We (the team) stopped for about 3 minutes to watch it. When it pulled back up into the cloud we continued practice. The only person who showed any real concern or fear of the storm was some kindly gentleman with a Boston accent who took the time to run into his back yard and scream at us before he disappeared into his cellar. I don't remember if sirens went off or not. I do remember it wasn't raining much at all on the field and the cloud cover seemed high and visibility was unusually good (Will, diary)

and:

...If I am outdoors during the severe weather season and the sky takes on a sickly yellow green hue I start telling people to be ready. Every time I've seen this sky, someplace close by has been pounded hard. I was outside hereon May 3, 1999³ and the sky was a dreadful shade of yellow that afternoon...(Will, diary)

In both cases, the two diary entries above characterize past experiences informing current thoughts and plans. This coincides with Elliot's (1997) reflection on a past event followed by another passage reporting an event as it occurs. This common quality confirmed that participants, whether impaired or able-bodied, experienced severe weather cognitively in a reflective state as well as in a current state.

³ The diarist is referring to the Oklahoma/Kansas tornado outbreak of 3 May, 1999 in which an F5 long track tornado wrecked havoc in south Oklahoma city and the suburbs or Bridge Creek, Moore, Del City, Newcastle, and Midwest City among others. See the NOAA web site for further details <http://www.nssl.noaa.gov/news/may3rd/outbreak.html>

In contrast, one participant with impairments withdrew from the study after only a month, but contributed several useable diary entries. Although the participant appeared very eager to take part in the project, critical priorities demanded immediate attention.

This participant commented:

I received the form, however; I am going to have to withdraw from the study...I have been sick the last month. You are welcome to use what I have submitted already. If you want to do an online interview just let me know. But I will not be submitting any additional entries (Marie, diary).

Simultaneously, an able-bodied participant was forced to withdraw due to problems beyond her control: “The reasons I could not continue is that I was unable to locate my original journal entries due to technical difficulties (Rachelle, diary).”

Accordingly, in these cases the combination of diary and interview was useful in offering participants different voices within which to express themselves. The examples above, of a diarist with impairments and a diarist with no impairments, indicates a commonality among the two. Therefore, common traits, instead of differences, are highlighted.

The research process also proved useful in identifying social networking (or capital). Social capital was most visible when respondents with sensory impairments adapted to severe weather alerts and events by establishing social capital on their own. Social networking, or helpseeking (Elliot, 1997), was a common topic in their actions.

I’m profoundly deaf and living in tornado country. All of us here – hearing or deaf – keep an eye out on the weather whenever a tornado is a possibility. I do have a hearing wife so that helps but I’ve lived alone and/or with other deaf people for a large part of my life sothose of us who are deaf usually have neighbors who will let us know if it (tornado siren) goes off ...I have my text messaging cell phone and could ask any number of people nearby...(Lane, diary).

and:

“I first heard through my co-workers that we might get a storm” (Ned, diary).

Social networking was also a factor in participants from group B. Similar to diarists with impairments, diarists without impairments relied on others to increase awareness of severe weather events and/or alerts, as evident in the following passage:

My girlfriend and I had just left a wedding reception ...twenty minutes into the drive the rain began to fall at a faster rate decreasing visibility. She became alarmed and turned the radio to the weather channel ... (Dan, diary).

The diarist with sensory impairments' reliance on his co-workers to inform him of approaching storms is a form of social networking. Social capital was also visible in the diarist without impairment as he relied on his girlfriend to turn on the radio to stay updated on weather conditions as decreased visibility demanded his full attention.

Participants with impairments who recorded diary entries about their experiences often recorded phenomena that appeared to be taken for granted. In this context, accounts of reliance upon, without question, were the local media.

I noticed a heavy (not severe) storm warning for the counties south of Cleveland county. This warning was on KOCO-TV channel 5. The storms are heading south (Ned, diary).

and:

...I try to watch TV if the weather looks bad. The weather reports here in OK take the weather VERY seriously and they generally do a good job interrupting regular programming if the weather warrants it (Lane, diary).

another:

I noticed a heavy (not severe) storm warning for the counties north of Cleveland County. This warning was on KOCO-TV channel 5 (Tom, diary).

Dan's reference to the car radio in order to learn the severity of a storm was representative of an able-bodied diarist relying on the local media to provide current severe weather information. This was also evident for another able-bodied diarist

I almost never watch T.V. If I notice any particular weather alerts, I'll pay a little more attention. If we're under a tornado watch or warning, and I'm at home. I'll turn on the T.V and see what the radar maps show (Will, diary).

These 13 excerpts, representing the accounts of both diarists with impairments and diarists without impairments, represented all five of Elliot's (1997) key response modes. With respect to Elliot's response modes, group A responded in 100% of each mode, and this was also true for group B. In addition, the diaries also corresponded to Zimmerman and Wieder's (1977) diary: diary interview chronological analysis of experiences. As a recollection of this analytical method, I list a passage from Zimmerman and Wieder. In their words:

A chronological record of experiences looks for indicators such as 'who' the diarist interacted with during the event; 'what' they did – in the form of a description of activities and discussions; 'where' – in the sense of the location of the activity and the movement of individuals within space; 'how' – involving a description of whatever organizational actions were entailed by the activity; and 'when', a reference to the time and timing of the activity with special attention to the actual sequence of events. Special attention was given to the diarists' choice of alternatives, and why certain choices were made instead of others as well as the consequences of these choices (Zimmerman and Wieder, 1977, 484).

In the chronological record, the 'who' aspect was represented in the accounts of both groups. For instance, the 'who' characteristic indicating who the diarist interacts with during the event was evident when a diarist who is sensory-impaired wrote

Channel nine issued a tornado watch in the late afternoon. My husband and brother were both with me at home when the national weather center in Norman issued the tornado warning for Cleveland County...my husband went to the closet, while my brother and I went outside to see if we could see anything (Marie, diary).

and, in another excerpt from a diarist with sensory impairment,

The storms are heading south. ..My son is outdoors...I had my wife call him to tell him that storms were approaching (Tom, diary).

In addition, the 'who' characteristic was visible in this anecdotal account from a diarist who has no impairments.

I have also slept through an earthquake while visiting friends in L.A. (Will, diary).

These three extracts show interaction between diarist and other people during severe weather events. The incidence of both group A and group B interacting with other people during severe weather events demonstrates commonalities between people.

The 'what' aspect was evident in one participant who was sensory-impaired, showing the description of activities and discussions:

Got up, checked for noise or thunder because I didn't know what it was at first. Sometimes it is the neighbor's car door which is close to the window. Saw flashes of light – that's a storm. Turned on the TV and didn't notice any warnings, alerts, anything. Okay...am I dreaming... My wife gets up and tells me its raining outside. I can't hear the rain and she can. Got a drink of water and looked out the backyard to check the power lines. They are swinging in the wind, but no real danger. I can fee the difference between a strong storm and weak storm. I get back to bed. My main concern is will my son wake up with all the thunder. Heck no, he's like his Mama sleeps through (Ned, diary).

and the diarist who had a physical impairment wrote:

...just when I entered my home the storm warnings were sounding. I turned on the TV to CBS News in OKC to keep up with the storms. After the incidents that I had in May, every time I hear the alerts I immediately start watching the weather reports (Randy, diary).

In addition, the 'what' characteristic is shown in this excerpt written by a group B diarist:

In the event of severe weather I immediately check the local news network ... to determine where the storm is and what direction it is moving. If I am in the proximity of the storm I take storm precautions. These precautions include cleaning out a closet, finding flashlights, getting blankets, and a battery powered radio. While I am in proximity of storm I become extremely nervous of the weather. I continuously listen to the news to find information concernng the direction and speed of the storm. If I am in immediate danger I will enter the closet that I had previously prepared (RaChelle, diary).

Each of the previous three passages demonstrates what the diarists did, showing both group A and group B diarists traits of the ‘what’ factor.

‘Where,’ in the sense of the location of the activity and the movement of individuals within space, was shown in diarists’ accounts. To this effect, participants from both groups demonstrated the ‘where’ factor:’ For example, a diarist with a sensory impairment reports:

Channel nine issued a tornado watch in the late afternoon. My husband and brother were both with me at home when the national weather center in Norman issued the tornado warning for Cleveland county...my husband went to the closet, while my brother and I went outside to see if we could see anything (Marie, diary).

and another diarist with sensory-impairments reports on his whereabouts during a storm:

Got up, walked to the window and checked for noise or thunder because I didn’t know what it was at first. Sometimes it is the neighbor’s car door which is close to the window. Saw flashes of light – that’s a storm. Walked to the living room, turned on the TV and didn’t notice any warnings, alerts, anything. Okay...am I dreamin? My wife gets up, walks in to the room and tells me its raining outside. I can’t hear the rain and she can. Walked into the kitchen, got a drink of water, went to the window and looked out the backyard to check the power lines. They are swinging in the wind, but no real danger... I walk into the bedroom and get back to bed (Ned, diary).

and then reports on the storm itself:

...storms started north of Perry and worked their way south the I-35 corridor. By 3 am it hit Norman. The TV finally tracks the storm and it is evident it is not a major storm. No hail or damage. Lots of lightening however (Ned, diary).

In addition, a diarist from group B comments on a weather experience that represents the ‘where’ attribute:

...I had the sound up loud, happened to get up and move to a different part of the apartment and then heard the siren (Will, diary).

Indicators of both location and movement were evident in the accounts from group A and B. The first diarist reports her husband moving to a closet during the alert, while the

diarist and her brother move outside the house to the yard to view the storm. The second diarist comments on his movements inside the home and then reports the storm's movements as seen on television. Last, the diarist from group B comments on his movements inside his apartment as he becomes aware of the storm. There is just one noticeable difference in the accounts from the two groups: Marie and Ned live in private houses, while Will resided in an apartment.

The 'how' factor, involving a description of whatever organizational actions were entailed by the activity, was visible in one of the diarists from group A as he wrote:

I live out of town so the siren/neighbor warning situation isn't available for me, but I feel fairly secure with the warnings available to me on the local TV channels. Of course, if the weather is bad enough to block my satellite signal, I might have a problem! If that happened and I was worried, I have my text messaging cell phone and could ask any number of deaf people living here due to the location in town of the Oklahoma School for the Deaf and quite a few hearing people have text messaging on their cell phones so they can communicate with their deaf co-workers or acquaintances (Lane, diary).

and another participant from group A wrote:

..... when we had severe weather during the night and lost power I was in bad shape. As you know I am on oxygen all of the time. My condenser operates from electricity. The power went off and I had to get up in the dark without oxygen and try to find my compressor tank in the kitchen that does not require power. The next night the power went out and the compressor tank ran out and I had to get up in the dark and go to the garage and fill up my container of liquid oxygen. This sounds easy but when I am off oxygen I can not breathe very well (Randy, diary).

Concomitantly, a diarist from group B made this entry:

I was in my dorm room when I heard on the radio that there was a severe weather warning...I noted the specific area where the storm was and what direction the storm was moving. Once I determined I was in no immediate danger I continued with homework. I passively listen to the radio updates only to make sure the storm had changed direction (Dan, diary).

A description of organizational action is evident in the actions taken by the first diarist, entailed by the severe weather, occurred as the first diarist reports his actions with and without electric power. Likewise, the second diarist reported his actions upon losing electric power due to severe lightning. These two accounts from group A represent a commonality with the third participant, an diarist from group B, in the 'how' attribute as the diarist from group B gave a descriptive account of his organizational actions entailed by severe weather in that he kept a record of the whereabouts of the storm and then continued his pre-storm awareness activity.

Diary references to 'when,' referring to the time and timing of the activity, and with special attention to the actual sequence of events was imprecise, but did occur in diarist accounts. 'Imprecise,' in this sense meant vague indicators to time, such as 'morning,' 'evening,' and 'late night.' There were, however, diary entries that did refer to specific times. For instance, the following two entries from group A diarists demonstrate the 'when' factor in vague and time-specific terms:

Around 7pm channel 9 issued a heavy rain alert for Cleveland County. We stayed tuned to the weather throughout the evening, by 8 pm the alert has been lifted. There were two other storms that came through but it was overnight storms and I slept right through them (Marie, diary).

In addition, Marie participated in an e-mail interview:

Researcher: I'm just wondering what you can tell me in regards to any experiences with storm shelters.

Marie: I don't have any experience using storm shelters. My parents have one on their property and they put it right after the May 3rd tornado. They live in the Bridge Creek area where the tornado hit. If I had one on my property I would definitely use it in the event of a tornado.

Researcher: any specific preparations?

Marie: Otherwise I just follow the home safety plan where we gather into the center of the house and stay in it until the storm passes. During the tornados that have hit my area in Moore, I pretty much stayed in the bathroom, since that is the room that is the center of the house. We had blankets and pillows in there with us just in case we had to seek cover.

Researcher: do you know how far away from your house are the shelters?

Marie: If the city of Moore has a community shelter I have no clue as to where it is. Guess that is something I need to look into since I am now responsible for 2 little ones instead of just myself.

Marie's choice of alternatives was specified when she referred to taking shelter at home instead of traveling to the next town where a shelter was located. She listed several reasons for this choice, particularly because she was following a home safety plan with pre-arranged accommodations. The consequences of the realization that the location of storm shelters in her town was unknown to her, resulted in the need to learn this information.

And, in the 'when' context, another diarist from group A wrote:

7pm – 11 pm. Watched TV, local evening news, heard thunder around 7pm, and again at 10pm. It rained and thundered all night long, up until through the morning...It's dark and late at night...(Ned, diary).

An e-mail interview also took place with Ned:

Researcher: I'm just wondering what you can tell me in regards to any experiences, if any, with storm shelters.....any specific preparations? For example, do you consider using storm shelters, and how far away from your house are they?

Ned: House comes with 8X15 storm shelter in the backyard, underground. Never go in it due to standing water and creatures that live in it. If a twister was coming though, I would use it. It's a huge slab of cement and concrete. It was built in the 1950s.

Researcher: Please comment on any alternatives you considered in choosing to go to one instead of another.

Ned: Alternative # 1 – in house, closet with mattress wrapped around is, a few years back it was exactly what we did.
Alternative # 2 – four shelters in Norman and we could drive to any one of them.

In addition, another e-mail interview with Ned revealed information concerning the reasons behind his decisions:

Researcher: Can you comment on the reasons behind your decision to take shelter at home instead of the shelter?

Ned: The communications is in your home. You got the tv on in the living room and the bedroom, opposite poles apart in the house. So, you make your judgment from data feeding in from local news. That's not going to happen in a shelter.

Ned: Closet – center of house, no glass, four walls, and a door. Of course an F-3 can easily send us to Purcell or at least Noble. You have to go outside to the shelter = time. And you have to go outside, get in your car and go to the shelter = more time.

Ned: the closet is the fastest place to go. Bathroom is recommended but I have a big window there and its an outside wall. Of course logic states that the house is a goner in a honorable storm.

Ned: I am legally blind with nighttime blindness so I can't drive and make left/right hand/eye coordination decisions like a normal person does. My house is set up where I know everything has its place. Plus, my house is brick.

Ned's choice of alternatives was specified when he referred to taking shelter at home instead of traveling to a community shelter. He listed several reasons for this choice, citing time, location, communication, and durability as factors in his choices. The consequences of deciding to seek shelter in his home 'a few years back' and doing the same following that incident can be inferred to mean that he regards the decision was a successful one.

With respect to the 'when' attribute, a diarist from group B commented about his experience during a severe weather alert. Similar to the two accounts from group A noted above, he used specific references to 'when' and vague terms such as 'morning.'

I was in my dorm room when I woke up to loud thunder. I noticed the time was 2:20 am. I believed we were experiencing another spring storm...the next morning I learned that we had been in a tornado watch and my roommate believed a tornado had touched down outside of town (Dan, diary).

A follow up e-mail interview with Dan concerning storm shelters revealed additional 'when' characteristics. Likewise, information such as consideration of alternatives and the reasons behind his selection instead of another are included:

Researcher: I need to ask you a few questions; they mostly involve any experiences you may have had with storm shelters.

Dan: I do not have a storm shelter close to my house nor do I know where the nearest one is.

Dan: As a young child there were times (I can remember at least 4 times) when my family traveled to take shelter in a designated "tornado shelter." This was a decision my parents made. As a child, growing up in "tornado alley," I appreciated going to the shelter instead of piling into the bath tub with my two other brothers while my parents threw blankets over us. As you can imagine there was not a lot of room to stretch out. I felt "safer" taking shelter in a designated "tornado shelter." I felt that taking shelter in the bath tub or any other place in the house would not keep me alive.

Dan: My experiences with these shelters for the most part have been positive. My family and I with several others in the area would huddle in a room with re-enforced concrete (it was always the same shelter approximately 6 miles from my home). Everyone would be in a positive attitude telling jokes and sharing funny stories. I felt secure and relieved to be there.

Researcher: do you consider using storm shelters, and how far away from your house are they? Please don't hesitate to include any alternatives you considered, in choosing to go to one instead of another, and if possible list the reasons behind your choice.

Dan: As an adult, however, I would not seek shelter at a designated "storm" shelter nor have I ever had to as an adult. The reasons being is that I feel more confident that I could "riding-out" the storm in my own house.

However, if the storm is severe enough, like the one in May of 1999, I would not hesitate to take shelter in a designated "tornado shelter." In most cases I would not travel to take shelter simply because I feel safe in my own home, and more importantly because I am too lazy to go to a designated shelter. With the advancement of technology, I find it comforting being able to see the storm tracked and told with good precision where the storm is and when the storm will hit. With that information I determine whether or not to leave my home and seek shelter some where else. If I had a shelter in my backyard, or a safe room, or perhaps a neighbor did I would be more willing to take shelter sooner rather than try to ride it out in my own house.

Dan: On whether or not to take shelter in a designated "storm" shelter I consider the immediate variability of a shelter, i.e. my own home or a neighbors shelter, if I have to travel to a shelter I would not go unless I felt I was endanger by staying at my home. The reasons are 1) because I feel it is safer to remain indoors watching the weather on T.V. and 2) I feel a sense of security being at my own home. Again however, if the storm is severe enough, I would not hesitate to take shelter in a designated shelter. I would travel as far as I needed to take shelter if the storm was severe enough. One alternative I might try (but only in rare circumstances) is to try and "out-drive" the storm. Again only in rare circumstances would I attempt this. Those circumstances being I am traveling between towns when a storm develops and I can not take shelter or I am traveling and there does not appear to be a "safe-place" to take shelter.

Dan's commentary revealed a number of 'when' attributes. His decision as an adult to not seek refuge in a designated storm shelter also represented a commonality with diarists from group A in the 'when' context who made similar choices. For example, Dan stated that he would not seek a storm shelter because he feels more confident that he could 'ride-out' the storm in his home. Dan feels satisfaction in that technology will keep him updated enough so that he is safe. In addition, distance was also a factor in his decision, in that he would seek shelter if there was a storm shelter within close proximity to his home but not a shelter further away.

Parallels with diarists from group A were identifiable. For example, all three participants cite travel time and the choice of remaining at home instead of traveling to a

community shelter. Comparable factors were also visible among the diarist from group B and one diarist from group A-the reliance on technology to provide accurate reports relevant to the severe weather event, and the potential for taking refuge in a neighbor's storm shelter.

A like quality was visible with respect to consequences of these choices. Likewise, the diarist from group B chose to seek shelter at home rather than a community shelter, and this decision was influenced by his past experiences of being taken to a community storm shelter, and a secure feeling associated with this situation. And, he recalls his time at a community shelter as comforting as opposed to the tight confines of taking shelter in a bathtub with his brothers. As a result of these memories, the group B diarist models his adult home after the conditions in the community storm shelters. Taking shelter in the home and based on past experiences is a common feature among the group B diarist and a diarist from group A.

Randy, the member of the study who suffered from mobility impairment, also participated in an e-mail interview. The meeting was conducted in order to learn how his impairment influences his response to severe weather. In addition, he was asked about his experiences with storm shelters.

Researcher: How would you describe your experiences with storm shelters, like for instance, do you consider using them and how far away from your house are they located? Please include any alternatives to seeking the shelters and the reasons behind this. Were there any consequences of your choice?

Randy: I have thought about storm shelters. But as you know, it is very hard for me to move from one place to another with my speed. If I get in a hurry I lose my breath. Also, if I go down in a shelter it would be hard for me to get out. I can not walk up an incline or climb stairs without completely losing my breath. I just do not have the lungs to do this.

Randy: When the Moore storm came through a few years ago I had to decide what to do. It was sighted coming to Norman at first. I just decided that I would go to my walk in closet and set in a chair and pray. As you know, the storm turned and went through Moore.

Randy: I really don't have that many choices. Also, getting tight places makes me have panic attacks. I take medication for this. But when you can't breathe very good you tend to panic a lot.

When compared to this diary entry from a group B diarist, commonalities and differences are revealed.

I'm both more than a little jaded and fortunate. I've experienced a great deal of severe weather and I don't get panicked. I also have a relatively safe storm shelter near-by. Not everyone is blessed with the availability of shelter and the mobility to get there as easily as I can (Will, diary).

Both diarists mention 'panic' as a factor in this context, although to separate ends-one diarist panics and the other does not. Therefore, the reference to 'potential panic' situations' was a common feature among the two diarists. However, the potential to panic led to opposite responses for each diarist. While the diarist from group A often panicked, the diarist from group B did not. Randy commented on his lack of choices as a result of his corporeality, which shows where adaptive strategies would be beneficial.

In contrast, Will had greater access to a storm shelter due to his mobility, and he is less vulnerable to severe weather events than someone with restricted mobility. In addition, his ability to remain calm without depending on medicine removes the panic attribute from his case.

There is an additional factor when considering perception and response to severe weather, which concerns sensory impairment. The factor was evident in Group A when Marie, Lane, Tom, and Ned made reference to their social networks in providing help with the detection of severe weather alerts. Social networking was also an important

factor in the case of Randy. Likewise, in the case of mobility-impairment, the mobility factor was more important to evacuating to safety and the provision of necessities. In Randy's case, the need to social networks was evident when he provided an account of the 'how' attribute, and commented about a power outage. The provision of goods from friends and/or family is evident in an e-mail interview with Randy:

Researcher: when severe weather is expected, and your inability impairment restricts you from going out and buying supplies, how do you make preparations?

Randy: I have friends go to the grocery store for me. They just stocked my shelves and refrigerator with food that I can eat during the storm.

I believe that reliance on social networks symbolizes an adaptive strategy, and warrants further discussion as a topic in itself. In the context of my study, it characterizes initiative on the part of my participants when the 'system' leaves them to fend for themselves.

My original research hypothesis, adaptive strategies of people with sensory-impairments and people with mobility-impairment are wholly a function of their impairment, proved to be partially false. Due to the fact that access to social networks was more important in how one reacts was unrelated to impairment. Another way of saying this is that adaptive strategies are the deciding factor in how someone reacts when severe weather threatens, as opposed to one's impairment being the deciding factor. It is only partially false because even the importance of a social network did not prove that impairment plays no role in organizing all adaptive strategies. A sufficient amount of social networking proved to be the deciding factor for Marie, Ned, Tom, and Lane in becoming aware of severe weather alerts. In the case of Randy, social networks, or lack

thereof, was the deciding factor, although his impairments were also a factor. More to the point, although Randy had limited social networks to help him prepare before the event, he lacked social networks during sudden and unexpected situations. Mobility restriction and lack of social networks resulted in evacuation difficulty and diminished the ability to take shelter. Therefore, in Randy's case it was a combination of impairment and lack of social networks that increased his vulnerability to severe weather.

Driedger et al., (2004) consistently emphasize the importance of time, space, and place as central aspects of disablement. Their research demonstrates that people with impairments experience disablement in diverse ways, ranging from coping strategies to shifts in living spaces. Further, the authors conclude that an individual's sociospatial and physical environments, and changes that occur within them, are intertwined.

Driedger et al.'s notions are represented in the analysis. For instance, time, space, and place each became important when Randy's environment was altered when lightning struck his oxygen tank. It is evident too, that in the context of severe weather, Marie, Ned, Tom, and Lane experienced severe weather in a different way than Randy, in that for the former the relevant phenomena was the perception of the severe weather alert, while the significant issue for Randy was evacuation and escape to safety. In addition, diarists divulged their coping strategies-Marie, Ned, Tom, and Lane relied on their able-bodied spouse and/or the local media to alert them of severe weather, while Randy was forced to fend for himself.

The analysis revealed that the three participants who suffer from hearing impairment rely partially on visual alerts to keep informed about severe weather. Moreover, the reliance on visual alerts by diarists with hearing-impairment for weather updates agrees

with the findings of Babiak (1998) and Wood and Weisman (2000, 2003). Nevertheless, my analysis showed that social networks were as important, if not more so, than visual alerts in perception of severe weather alerts, and any other type of weather alert for that matter..

My interest in how people with sensory and physical impairments adapt to severe weather events led me to an interest in the experiences of special needs people in terms of preparing for and responding to said events. Accordingly, the context for this study is one of an interest in how everyday experiences in the context of severe weather are influenced by the adaptive strategies of people with sensory and mobility impairments, and these everyday experiences revealed the importance for individuals to maintain strong social networks.

A chronological analysis of informants' personal experiences demonstrated that the formation of social networks placed group A in a parallel state with group B, with the exception of Randy, whose experiences“ were ‘different.’ Many worlds were visible in this research when comparison between groups revealed a fragmentation. This divide signified a ‘difference’ between the groups when one of the diarists in group A was unable to strategize, and thus unable to reduce his vulnerability to the storms.

5. CONNCLUSION

In this project, hazards were used to discuss the personal experiences of people with impairments. Personal experiences are one of Gleeson's (2001) four sub-streams of disability literature. Along with accessibility and mobility issues, service provision, and production of difference, personal experiences make up the geographies of disability.

Geographies of disability are a complex concept involving

space, and related issues such as mobility and accessibility, are profoundly important to disabled people's everyday lives... and how geography shapes the experiences of disabled people ... how space, place and issues such as mobility inform the experiences of disabled people (Gleeson, 1999, back cover).

Gleeson's (2001) four sub-streams of disability literature (Chapter 2) provide additional details on the geographies of disability. The original intention of my study was to expose the strength of the relationship among sensory and/or mobility impaired people as a vulnerable social group, more vulnerable than the mainstream population, when considering perception and response. My research hypothesis, that adaptive strategies of people with sensory-impairments and people with mobility-impairment are wholly a function of their impairment, proved to be only partially correct. Results of the analysis revealed that a key deciding factor was the existence of social capital (social networks).

Answers to my research questions demonstrated that the research filled gaps in the existing geography of disability literature. The primary research question asked how individuals with sensory impairments perceive alerts, and how individuals with mobility impairments respond to evacuation needs, and demonstrated that participants'

vulnerability varied when considering severe weather. Participant coping strategies before, during, and after, severe weather alerts reflect components for type and degree of impairment. My research accounts for multiple impairments, and considers different adaptive strategies of each. Thus, it is consistent with the research of Golledge (1997) and Butler and Bowlby (1997) in recognizing new medical geography standards. In doing so, my research is empowering and acknowledges the humanness (page 48) of impairment. The humanness of impairment refers to the denial of the social model of disability, which emphasizes treating all disabling conditions as if they derive from the same source. I feel that analyzing disability from a new medical geography perspective provides a more complete and thorough analysis than observing the lack of resources available to him.

Emergency shelters, both private and community-based, played a small role in the analysis. The people with whom I worked generally did not consider using emergency shelters in the event of severe weather warnings. Use of shelters ranged from 'none at all' to 'considered going to one, but then choosing an alternative' to 'only in extreme cases' to 'taking shelter at home' for Marie, Ned, Lane, Tom, and Will, Dan, and Rachelle. Randy again demonstrated difference when considering storm shelters. He responded that they were not an option for him because of his mobility impairment. In his case, the impairment was more important than adaptation.

Although the usage of emergency shelters was limited, data concerning them nonetheless fill a gap in the disability literature, notably within accessibility issues and production of difference. A link with secondary research questions and to the primary research question is also present. For Marie, Ned, Tom, and Lane, warning perception

led to plans to, or plans not to, seek shelter. In Randy's case, preparation and seeking shelter and whether or not he had access to adaptive strategies affected his vulnerability.

My secondary research questions examined the primary research question in more detail. It was revealed that diarists with sensory-impairments reduced their vulnerability to severe weather events by adapting and strategizing to use existing social networks, or forming new ones. In contrast, the diarist with mobility impairment had access to social capital only partially, and had to prepare and respond to evacuation needs on his own. Accordingly, investigation into how people with impairmentst become aware of alerts, prepare, and respond to severe weather contribute to the personal experiences literature by demonstrating negotiation of the environment in a certain situation. The ability to adapt, and compensate for impairment, proved to be the most critical indicator of difference, and thus vulnerability. Consequently, in the context of disability and hazards, an examination into social networks contributed to production of difference literature.

When considering sensory impairment, commonalities were consistent with groups A and B in terms of both Elliot's (1997) and Zimmerman and Wieder's (1977) analyses. However, variations were found when considering mobility impairment with respect to the 'how' attribute in the Zimmerman and Wieder analysis. This variation was not visible in the Elliot analysis because one participant, Randy, had limited access to social networks that could have aided him when the severe weather event was predicted early and he had time to prepare. In Randy's case, vulnerability was enhanced by his impairment.

Directions for further research are plentiful in the context of disability and severe weather events. One important question that requires further research is how to

accommodate special needs groups when disaster strikes a large population. Quite often, special needs groups are abandoned in favor of people without impairments. A strategy needs to be developed that will not discard one group or individual to save another. Too often emergency personnel have to make split-second decisions and do what seems reasonable. One possible solution would be restricting the amount of people in hazardous areas. An interesting study would be to perform a regional survey, asking how willing people would be to risk their own life to help someone with special needs in the event of catastrophe. Results from each region could then be compiled and compared with the other regions to learn where social networks are favorable.

The naturalness of hazards should be questioned following every extreme environmental event, such as done in Rydin (2006) for Hurricane Katrina. An investigation into subjective factors leads to controversial issues, such as political criticism and calls for justice. These calls for justice are the directions for further research in the context of special needs groups and hazards. According to Rydin, geography is the discipline that is capable of *knowing* what to do and of *doing* it.

People with special needs groups must come to terms with their increased vulnerability to hazards when compared to mainstream populations. And, in recent times, worldwide terrorism is a very real threat, and special needs populations must face the threat like everyone else. Accordingly, emergency management and nationwide preparedness organizations have a responsibility to explore the links between special needs groups' necessities in a hazards situation and those requirements in a terrorism context. Such research should take note of similarities and differences, as well as

available resources and then plan accordingly. I believe my research will contribute to this issue.

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APPENDIX I

From <http://www.adagreatlakes.org/ADA/>

The ADA, passed in 1990, is a federal civil rights law that prohibits discrimination on the basis of disability. The ADA defines a disability as: a physical or mental impairment that substantially limits one or more major life activities (i.e. working, talking, hearing, seeing, and caring for ones self)

Or having a record of such impairment;

Or being regarded by others as having such impairment, such as individuals with severe facial scarring marginalization

APPENDIX II

I have a hearing impairment, vision impairment, and mobility impairment. While growing up in Milwaukee, I was told by doctors (through my parents) that I had a deteriorating hearing loss that was caused by a case of German Measles that I had as an infant. While in high school I had cataracts removed from my eyes, and had lenses placed in my eyes to stabilize my vision. Despite this, I was able to participate in varsity sports and graduate in the top 10 percent of my class of 500. during the summer of 1989, the retina in my left eye became detached, and I had it reattached to save the eye. The correction lens in the eye had to be removed following the retinal procedure, leaving my vision very poor.

From 1989-1999 I attended the University of Alabama (Tuscaloosa) where I earned my bachelor's and master's degrees –both in geography. During my 3rd semester at Alabama, I had a detached retina reattached in my right eye. Again, the correction lens was removed and my vision left very poor. It was around this time when I began to notice balance problems, and I attributed them to my poor hearing and vision. I was admitted to the doctoral program in geography at the University of Oklahoma (OU) in 1999. In November 2004 in Oklahoma City, I received a cochlear implant in my left ear, and this greatly improved my hearing. It was around this time that an endocrinologist attributed my lack of growth, muscle growth, and energy to a hormone deficiency. He prescribed a hormone enhancement medication and Human Growth Hormone injections for me, both of which I continue to use. Nonetheless, conducting the research and writing of this dissertation has been a long and difficult process.