2012

Influences on behavior adaptations to reduce exposure to environmental hazards among residents of Louisiana's upper industrial corridor

Corrinthia Marie Hinton
Louisiana State University and Agricultural and Mechanical College

INFLUENCES ON BEHAVIOR ADAPTATIONS TO REDUCE EXPOSURES TO ENVIRONMENTAL HAZARDS AMONG RESIDENTS OF LOUISIANA'S UPPER INDUSTRIAL CORRIDOR

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
In partial fulfillment of the
requirements for the degree of
Master of Science

in

The Department of Environmental Sciences

by
Corrinthia M. Hinton
B.S., University of Arkansas at Pine Bluff, 2009
May 2012

This thesis is dedicated to my son, Nehemiah J. Hinton. He was always a source of motivation through these past few years and I will always be grateful for his unconditional love and his ability to unknowingly push his mama forward.

ACKNOWLEDGEMENTS

There are so many people for which I'm grateful for their help while completing this thesis. First and foremost I would God, for without him I'm nothing but with him I can do all things. Next to my family who have supported me the entire way and told me to just keep going and finish. Special thanks to my mom and dad for making sure I had every opportunity available to me.

I would also like to thank my advisor Dr. Margaret Reams and the other members of my committee, Dr. Nina Lam and Michael Wascom. Thank you all for bearing with me whether I was a short or long distance away.

Many thanks to my good friend Willie R. Wiley for his love and support and for being there no matter what. You were truly a rock to lean on and for that I am grateful. Last, but certainly not least, thank you to a special five year old, Nehemiah Hinton. I'm especially thankful for the times I was working and he came by and simply shut my laptop. Without him, there would be no breaks. I love you all and can't express my gratitude enough.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Over the past century, the growth in petrochemical manufacturing within Louisiana's Upper Industrial Corridor brought economic development, but also introduced toxic emissions and environmental exposure risks to residents of the area. For the citizens living in close proximity to multiple facilities there is the added risk of chemical exposure from environmentally hazardous accidents. This study seeks to gain insights into patterns of risk-reducing behaviors of residents in East Baton Rouge Parish so that better educational outreach programs can be developed. This research addresses the following questions: To what extent are residents of Baton Rouge taking steps to reduce environmental exposure risks? What factors may influence adoption of exposure-reducing behavior? For this study, "adaptive behaviors" are: the adoption of a household emergency plan, more frequent checking of daily air quality ratings, and changing plans for outdoor activities on bad air quality days. Interviews with 68 residents were conducted to learn about their environmental knowledge and risk perceptions, and the extent to which they have adopted these three risk-reducing behaviors. Factors that may influence such adaptive behaviors include income, education, and proximity to regulated facilities, length of residence in the community, risk knowledge levels, and membership in local environmental groups, among other factors. The research also explores differences between interviewees living in zip codes with Toxic Release Inventory reporting facilities and those living in zip codes that do not contain the facilities.

The statistical analyses indicated that demographics, such as age or education levels, and membership in local environmental groups may not play a major role in implementing these adaptive behaviors. Rather, the analysis indicates that residents who have adopted

household environmental emergency plans are more informed and have a higher degree of confidence in their own knowledge of hazards and options to reduce exposure risks. Also they tended to know about and adopt other exposure-reducing behaviors. Information gained through this analysis suggests that exposure-reducing behaviors tend to be linked, and that educational outreach programs may need to focus first on effective ways to simply inform residents of risk levels and exposure-reducing strategies in order to increase their awareness and confidence in their abilities to make themselves safer.

1. INTRODUCTION

1.1 BACKGROUND AND PROBLEM STATEMENT

The East Baton Rouge Parish communities have experienced the effects of the increased industrialization since the early 1900s. With the initial expansions of the petrochemical plants into the area there have since been many industries that contribute to the overall release of regulated substances into the surrounding environment. Educational outreach programs need to reflect on the most effective method of relaying information to the citizens of Baton Rouge and similar communities facing cumulative environmental exposure risk to encourage adoption of risk-reducing behaviors. Examining the extent of citizen awareness and behavioral adaptation can help establish a theoretical framework for more effective educational community outreach programs.

Factors influencing exposure-reducing adaptations among residents in East Baton Rouge Parish will be studied through statistical analysis of data gathered during citizen interviews conducted at three public meetings during the Fall and Spring of 2010 and 2011. This research addresses the following questions: To what extent are residents of Baton Rouge taking steps to reduce environmental exposure risks? What factors may influence adoption of exposure-reducing behavior? For this study, “adaptive behaviors” are: the adoption of a household emergency plan, more frequent checking of daily air quality ratings, and changing plans for outdoor activities on bad air quality days. Potential influences to be examined include socio-economic attributes of residents, membership in environmental groups, experience with past

environmental emergencies, TRI emissions within the community, knowledge of local environmental hazards, and confidence in respondents' abilities to reduce risks

There has been an abundance of material made available to the public to help them understand what is occurring in their communities and how best to deal with the circumstances surrounding their everyday lives. A few examples are the annual Toxic Release Inventory (TRI) reports, the ozone readings released daily in East Baton Rouge Parish, or literature on precautions to take during and after environmentally hazardous events to reduce exposure risks. Even with this information made available to the public, there may be a communication gap between the sources of the information, the educational outreach programs that make the information available, and the people that would benefit most from the information. A framework to better understand the citizens' behavior would help bridge that gap and aid in the establishment of environmental health outreach programs.

1.2 INDUSTRIAL GROWTH AND EXPOSURE ISSUES IN THE UPPER INDUSTRIAL CORRIDOR: HISTORY OF BATON ROUGE

During the early 1900's there was economic growth in the area due to the natural resources available, such as salt, petroleum, and natural gas (Thomas, 1999). The readily available resources brought in more businesses that specialized in petrochemicals. With the industrialization and development in the city came some adverse environmental effects. Despite significant improvements in environmental protection over the past several decades many continue to live in unsafe and unhealthy physical environments (Bullard and Johnson, 2000).

Ever since the establishment of the National Environmental Policy act in 1969 federal regulations and policies have evolved to protect the environment from adverse effects caused by man, while allowing for the economic betterment of mankind. Under Federal law, chemicals that are released into the environment or any act that could have a considerable effect on the environment are either monitored or regulated. Many of the industries that are located in the East Baton Rouge Parish are regulated because of their emissions.

The emissions that effect the environment in Baton Rouge are predominately regulated by the Environmental Protection Agency and also through the Louisiana Department of Environmental Quality. These agencies operate under 32 federal laws such as the Clean Water Act and the Clean Air Act. The most essential laws that affect toxic emission regulations for the industries in Baton Rouge are shown in Table 1. The table shows the laws and the overall purpose of each law.

Table 1: Laws That Affect Toxic Emission Regulations in East Baton Rouge Parish

Law	Purpose
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the Small Business Liability Relief and Brownfields Revitalization Act of 2002)	Address Abandoned Hazardous Waste Sites in the U.S.
Clean Air Act (CAA)	Air Pollution Prevention and Control
Clean Water Act (CWA)	Regulate Discharges of Pollutants Into the Waters of the U.S.
Emergency Planning & Community Right-to-Know Act (EPCRA)	Help Local Communities Protect Public Health, Safety, and the Environment from Chemical Hazards

(Table 1 Continued)

Resource Conservation and Recovery Act (RCRA) (amended by the Hazardous and Solid Waste Amendments of 1984)	Governing the Disposal of Solid and Hazardous Waste
Toxic Substances Control Act of 1976	Require Reporting, Record-keeping, Testing Requirements, and Restrictions Relating to Chemical Substances and/or Mixtures

Note. Table 1 information from the Environmental Protection Agency (www.epa.gov) obtained December 7, 2011.

"The Emergency Planning and Community Right-to-Know Act (EPCRA) was passed by Congress under Title III of the Superfund Amendments and Reauthorization Act of 1986, to acknowledge the importance of public awareness and emergency planning for community safety" (Louisiana Department of Environmental Quality, 2006). Under sections 311, 312, and 313 of the EPCRA facilities businesses, federal, and state governments are required to report the locations, quantities, transfers, and releases of certain chemicals. This information is to be collected and reported annually to the federal government (the EPA particularly) and the information is then made available to the public as the Toxic Release Inventory. "The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed" (Louisiana Department of Environmental Quality, 2006). Currently there are 23 facilities in East Baton Rouge Parish that release chemicals into the environment and they discharged approximately 10 million pounds of chemicals collectively in 2010 (Environmental Protection Agency, 2011). There are 78 reporting facilities including the areas immediately surrounding East Baton Rouge Parish.

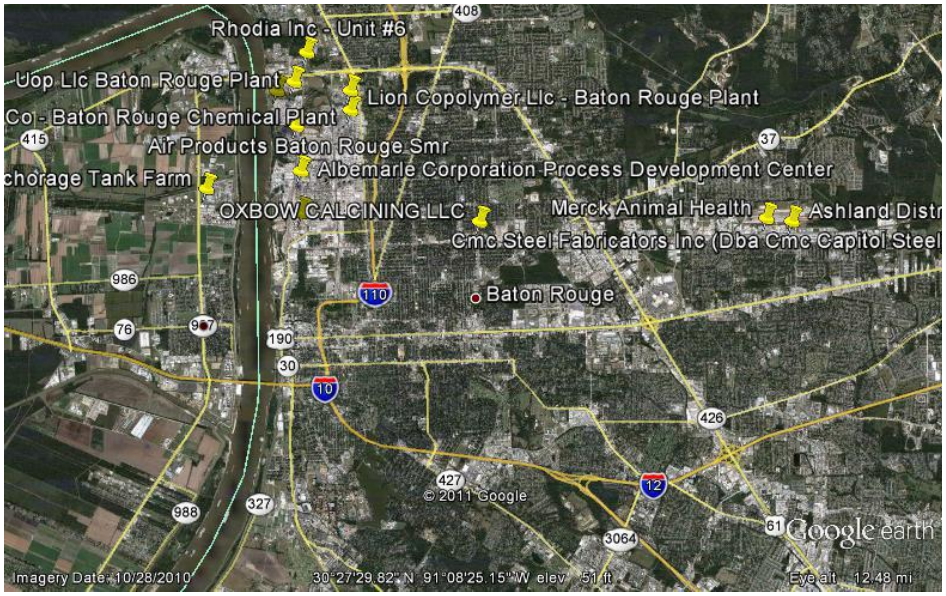

Figure 1: Toxic Release Inventory Reporting Facilities in East Baton Rouge Parish. November 26, 2011 (compiled by author)

All of the facilities that report toxic releases in and around East Baton Rouge Parish contribute to the overall output of chemicals in the area that may have an effect on humans or the environment. The chemicals that are regulated by the Environmental Protection Agency in Baton Rouge are done so to protect the environment and human health. Each of the chemicals regulated have been proven or are speculated to cause some adverse effects when they are not released in moderation. There still may be some doubt as to whether the released chemicals may cause some adverse effects even though emissions are regulated.

The top 10 chemicals released by the facilities reporting Toxic Release Inventories in Louisiana are shown in Table 2 (according to LDEQ's most recent report written in 2006). The table also shows the amount of each chemical released and the media in which they were released into.

Table 2: Reprinted 2004 Toxics Release Inventory Annual Report by the Louisiana Department of Environmental Quality (2006).

2004 TOP 10 CHEMICALS

RANK	CHEMICAL	AIR	WATER	LAND	INJECTION	TOTAL
1	METHANOL	14,342,510	194,755	370,639	2,680,594	17,588,498
2	AMMONIA	11,747,287	617,503	6,456	4,011,773	16,383,019
3	FORMALDEHYDE	368,928	33,530	25,460	10,674,989	11,102,907
4	NITRATE COMPOUNDS	0	8,510,796	17,997	1,731,734	10,260,527
5	MANGANESE COMPOUNDS	45,716	391,258	5,964,830	0	6,401,804
6	NITRIC ACID	45,371	5	920	5,219,307	5,265,603
7	BARIUM COMPOUNDS	70,200	40,931	4,299,382	831	4,411,344
8	FORMIC ACID	30,425	2,939	0	4,300,082	4,333,446
9	ZINC COMPOUNDS	121,547	72,325	3,952,046	287	4,146,206
10	N-HEXANE	3,690,006	350	57	42,177	3,732,589
	TOP 10 CHEMICAL TOTAL					**83,625,944**
	STATE TOTAL					**124,616,228**

The hazardous chemicals are listed in the table above cause negative reactions to humans or the environment but Formaldehyde is the only top listed chemical that is classified as a known carcinogen. There are many other carcinogens that are released such as benzene, acetaldehyde, and chloroprene. The release of carcinogens has long caused a debate as to whether those living in the immediate vicinity of the industries releasing them are more susceptible to develop cancer and experience other adverse health effects than those living elsewhere (Boeglin, Wessels, and Henshel, 2005). The monitoring of the release of these chemicals has become an important public health issue to community stakeholders and the residents living near many of Baton Rouge's industries.

1.2.1 OZONE AND THE AIR QUALITY INDEX

Ozone (O_3) is a gas composed of three oxygen atoms and is not usually emitted directly into the air, but is created at ground-level by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight (Environmental Protection Agency, Ground level ozone, 2011). Although it is not listed as a one of the top

emitted chemicals in the state, one of the most persistent problems within East Baton Rouge Parish has been ground-level ozone formation. There are six EPA air quality standards which address:

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Ozone
- Particle Pollution
- Sulfur Dioxide

Of the six EPA air quality standards, the only one Baton Rouge has not been able to consistently meet is the ozone attainment level. With the collaborative efforts of the government and the businesses in Baton Rouge, the city has been able to improve the air quality over time (Baton Rouge Clean Air Coalition, 2011). According to Dave Bary and Joe Hubbard of the EPA, "On Aug. 31, 2010, Louisiana Department of Environmental Quality submitted a request to change the area's designation to attainment and maintenance plan to EPA" (Bary and Hubbard, 2011). They continue on stating, "Preliminary air quality data for 2011 continues to show that the area meets the 1997 8-hour standard as well as the 1-hour standard for ozone" (Bary and Hubbard, 2011). Although the greater Baton Rouge area has constantly dealt with ozone attainment problems, the year of 2011 marks a progressive step forward for the city in its status change from non-attainment to attainment for the 1997 8 hour ozone standard.

Ozone pollution can be a major problem for the citizens of the East Baton Rouge Parish due to the negative effects high level of ozone may have on human respiratory systems. According to the Environmental Protection Agency's information on the health effects of ozone

in the general population, ozone inhalation may have adverse effects such as: induction of respiratory symptoms, decrements in lung function, inflammation of airways, coughing, throat irritation, Pain, burning, or discomfort in the chest when taking a deep breath, chest tightness, wheezing, or shortness of breath (Environmental Protection Agency, Ground level ozone, 2011).

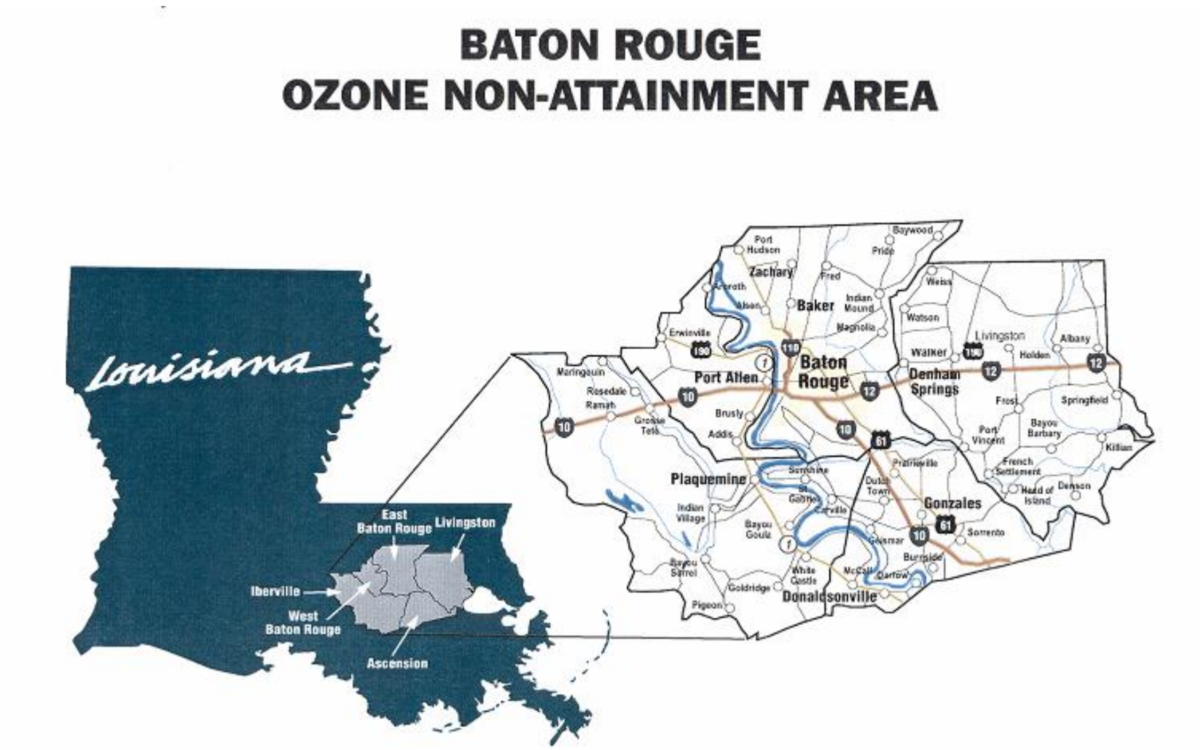

Figure 2: Reprinted from Baton Rouge Non-Attainment areas by Louisiana Department of Environmental Quality. Retrieved October 27, 2011 from http://www.deq.state.la.us/portal/Portals/0/AirQualityAssessment/Baton%20 Rouge%20Ozone%20Non-Attainment%20Area.pdf

The Louisiana Department of Environmental Quality Air Permits Division has developed a subdivision that deals with information on ozone and ozone attainment and an ozone action program. These programs were developed to address community concerns and improve community outreach effectiveness concerning Louisiana’s ozone non-attainment. The agency

provides facts about ozone, what can be done on the individual level to reduce ozone emissions, and how to understand the air quality index.

The Air Quality Index or AQI was developed to help people comprehend what the daily air quality ratings are and how air quality could affect their health. To make it easier to understand, the AQI is divided into six categories which correspond to a different level of health concern. The six levels of health concern and what they mean are provided in the chart below. EPA has assigned a specific color to each AQI category to make it easier for people to understand quickly whether air pollution is reaching unhealthy levels in their communities.

Table 3: Reprinted from Understanding Air Quality Index by Louisiana Department of Environmental Quality. Retrieved October 27, 2011 from http://deq.state.la.us/portal/PROGRAMS/OzoneActionProgram/UnderstandingtheAirQualityIndex.aspx

Colors	**Air Quality Index (AQI) Values**	**Levels of Health Concern**	**Meaning**
…as symbolized by this color:	***when the AQI is in this range:***	***…air quality conditions are:***	***the health implications are:***
Green	**0 to 50**	**Good**	**Air quality is considered satisfactory, and air pollution poses little or no risk.**
Yellow	**51 to 100**	**Moderate**	**Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.**
Orange	**101 to 150**	**Unhealthy for Sensitive Groups**	**Members of sensitive groups may experience health effects. The general public is not likely to be affected.**

(Table 3 Continued)

Red	**151 to 200**	**Unhealthy**	**Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.**
Purple	**201 to 300**	**Very Unhealthy**	**Health alert: everyone may experience more serious health effects.**
Maroon	**301 to 500**	**Hazardous**	**Health warnings of emergency conditions. The entire population is more likely to be affected.**

Louisiana has a system where the daily air quality ratings can be checked either on the internet or over the phone. There is also a phone and personal computer application that is being developed where citizens can check the daily air quality by simply pushing a button on their personal device. Some organizations such as the Baton Rouge Clean Air Coalition have also relayed some information as to what the residents of Baton Rouge should do on bad air quality days to prevent exposure (Baton Rouge Clean Air Coalition, 2011). The most widely accepted recommendation is for residents to minimize outdoor activity on bad air days and for people with respiratory problems to avoid going outdoors altogether if possible. Individuals who have learned of this issue and check the daily in order to avoid outdoor activity on the bad air days display some adaptive behaviors on those days with poor air quality in Baton Rouge.

1.2.2 HOUSEHOLD EMERGENCY PLANS

In the occurrence of an emergency the Mayor's Office of Homeland Security and Emergency Preparedness has provided information as to what individuals should do before during and after an emergency. These plans would be applicable to a range of emergencies including natural disasters, plant explosions, and hazardous material spills. The agency

provides different sources to stay informed and specific actions to take if either an evacuation is ordered or an order to shelter in place is determined. They also provide a model family emergency plan to help the entire household be prepared. The elements of an emergency plan are listed as follows:

1. Have a meeting with the members of your household to discuss the possible emergencies that exist and how to respond to each.
2. Identify the safe areas in your home for each type of emergency.
3. Explain what to do about power outages and personal injuries.
4. Draw a floor plan of your home and identify two escape routes from each room.
5. Show household members how to turn off the electricity, water, and gas at the main switches when necessary.
6. Identify emergency phone numbers and post near telephones.
7. Teach your children how and when to call 911.
8. Identify one out-of-state and one local contact (relative or friend) for family members to call if separated during an emergency.
9. Teach your children the phone numbers for your contacts.
10. Identify two emergency meeting places: near your home in case of a fire & outside your neighborhood in case you cannot return home after an emergency.
11. Take course for CPR and First Aid.
12. Family records should be kept in a water and fireproof container.
13. Instruct family members to monitor local radio and television stations for emergency information.

All of this information is provided for citizens on the Mayor's Office for Homeland Security and Emergency Preparedness website, http://www.brgov.com/dept/oep/ . However, there does

not appear to be a broad public educations campaign underway in East Baton Rouge Parish by the Office for Homeland Security and Emergency Preparedness to relay this information to the community.

CHAPTER 2. RELATED RESEARCH CONCERNING RISK-REDUCING BEHAVIOR

2.1 RESILIENCE

Examining the adaptive behavior of the residents of Baton Rouge may help shed light on the overall social-ecological resilience of the communities in the area. Resilience is defined as the capability of systems to withstand changes and continue to function. The concept of resilience was introduced by C.S. Holling in 1973 to explain the behavior of dynamic systems away from equilibrium when they are impacted by a disturbance. This research is examining the adaptations of the residents of Baton Rouge to environmental hazard exposure. These adaptations taken by the residents of Baton Rouge can help make the community more resilient.

The Resilience Alliance, "a research organization comprised of scientists and practitioners from many disciplines who collaborate to explore the dynamics of social-ecological systems," determined three key characteristics of resilience: the amount of change a system can experience and still maintain the same controls and/or function; the degree to which a system can self-organize; and the system's ability to build and increase its capacity for adaptation and learning (Carpenter et al. 2001, Holling, 1996).

Over time two concepts of resilience have developed: engineering and ecological. Engineering resilience is the measure of how quickly a system returns to a steady state following a disturbance (Pimm, 1991). Ecological resilience can be defined as a measure of how far a system can be disturbed or the magnitude of the disturbance it can absorb before it shifts to another regime (Walker et al., 2006). Engineering resilience assumes only one stable state or

domain for a system, whereas ecological resilience denotes multiple equilibrium domains for the system (Gunderson, 2000). In the case of this study, ecological resilience is more relevant than engineering resilience.

Susan Cutter posed the question whether societies are becoming more vulnerable to environmental hazards (Cutter, 1996). According to Abel, the ability to self-organize is the foundation of resilience and others have pointed to the need to share scientific information about changing risks and the need to know what adaptions can be made (Abel et al., 2006). This states the need for local systems to be sufficiently self-reliant but yet remain connected to a larger system to be less vulnerable. If the local system is not self-sufficient to an extent or interconnected to a larger system (statewide or nationwide), the answer to Cutter's inquiry will be affirmative, that a society (or in the case of this research the residents of Baton Rouge) is becoming more vulnerable and in turn less resilient.

2.2 ADAPTIVE BEHAVIOR

Human beings have the unique capability to adapt to most situations. Normally, in nature, when referring to adaptation, it is in reference to evolutionary adaptations that may occur over an extended period of time. This is normally through biological and physical means and by genetic changes throughout numerous generations. Although this may hold true, there are other means of adaptation that show more immediate results but do not alter specimen biologically or physically. This is one method of adaptation where human beings excel.

Adaptation may be thought of as a process of deliberate change in anticipation of or in reaction to external stimuli and stress. Also, it is the decision-making process and the set of

actions undertaken to maintain the capacity to deal with current or future predicted change (Nelson, Adger, and Brown, 2007). Some factors that may determine an individual's actual awareness or perception, determining the amount of exposure to environmental hazards is more difficult. The amount of exposure can rely heavily on a person's adaptive behavior which in turn is shaped by their experience, awareness, and perception. Someone may have the awareness and perception that exposure is harmful but whether or not they take action to reduce the potential of exposure relies solely on their behavior.

Adaptation can occur in many different ways. One widely accepted belief is that adaption occurs with experience of dealing with a major social-ecological disturbance or stressors. Nelson, Adger, and Brown proposes that adaptation to environmental change is best formulated as an issue of system resilience, drawing on perspectives from newly emerging research on governance, adaptive capacity, and the robustness of response strategies (2007). Although this research is done in observation for a community as a whole, it may be applied individually for those who take precautions to reduce their own exposure. It is possible to observe the system not as a community but as an individual so that observations may be made of individual adaptive behavior.

If one were to apply this theory and observe the adaptations of an individual and determine his or her resilience, that individual would have to have had some previous exposure to a major disturbance or stressor. This may not always be the case when trying to observe adaptations at an individual level. Some adaptations may arise due to everyday life experiences (Sarah E.L. Wakefield et al., 2001). Wakefield and her associates were able to interview citizens

and determine their adaptive behavior to air pollution exposure. They determined that the residents modified their behavior in numerous ways to try and deal with poor air quality (Wakefield et al., 2001). There were 21 interview responses and of the twenty-one: 17 demonstrated a reappraisal of lifestyle options such as staying indoors and not hanging laundry outside; 6 demonstrated personal change such as recycling and use or alternative transit such as bicycling or bus; 5 demonstrated individual civic action such as complaints to industry, government or media; 2 demonstrated group civic action such as attending public meetings and/or protest (Wakefield et al., 2001).

This method of adaptation observations is more useful when determining contributing factors and adaptive behaviors at an individual level. These citizens are experiencing disturbances or stressors but the disturbance is over an extended period of time in which the effects may manifest gradually and not in one major event making this framework more applicable.

Adaptations by humans to environmental hazards and the factors that influence these adaptations is one of the key focal points of this thesis. Although human adaptations may have been under review for many centuries now, the adaptations of humans due to environmental hazards has become a more relevant topic over the past few decades. The other two relevant topics of awareness and perception became exceedingly popular also. The three subjects can be extremely interrelated. Whereas one may be aware of a hazard, perception may depend on the extent of awareness or awareness may depend on perception. In the end, the amount of adaptive behaviors, if there are any at all, may be due to awareness and perception.

Human beings may have numerous influences that affect the extent of their adaptive behavior. Some of these influences are essentially awareness and perception. It is logical to perceive that if a body has any amount of awareness of a potential hazard to their person they may take steps to either remove the hazard or remove themselves from the vicinity of the hazard. This also holds true for an environmental hazard. "Response to an environmental hazard is related to the perception and awareness of opportunities to make adjustments to the hazard" (Kaufman, 1995). Kaufman uses the works of Burton et al (1978), Kates (1973), and Eriksen, (1975) to state, "When response occurs, the level is dependent on the experience with a particular hazard, the capacity to change, the economic means available and the consideration of perceived economic gains, and the personality traits of the individual or society" (1995). It is thought that perception due to previous exposure and awareness may influence whether a person has shown some exposure reducing behavior over time. In this thesis we will view the different factors such as awareness, risk perception, adaptations, and community resilience.

2.3 AWARENESS OF HAZARDS

Awareness is a state of knowledge or concept that may or may not be conscientiously acknowledged. Awareness tends to grow with the increase of knowledge on a subject. This is a more basic concept or understanding of awareness. When applied to a subject matter it becomes a more complex state of knowledge, depending on the complexity of the matter. In the case of this thesis it is applied to the environment.

Research has been conducted over recent years to gauge the amount of environmental awareness amongst residents of different areas. Most research has focused on environmental

awareness on a national or global level, with less attention focused at the local level. That leaves a major gap relative to the effectiveness of informing people of environmental issues and/or hazards. Most people are affected more on the local level than that of a global level, especially if they are living within a close proximity to the source of the hazard. The local level effects have a more immediate or short-term effect also whereas national or global environmental issues such as global warming and deforestation have a long-term effect.

One study in particular reviews public awareness of risks observable at the local level in the Mississippi Delta region. This study is relevant to this thesis in that it deals with local level awareness in an area that is demographically similar to Baton Rouge. In this study titled Factors Affecting Environmental Awareness Among Headstart Families in Mississippi, Dr. Benjamin L. Preston, Dr. Rueben C. Warren, and Dr.Peter Stewart distributed surveys to Headstart families in 20 Mississippi counties. The study was conducted to find possible correlations between environmental awareness and the demographics of the low-income families that utilize the Headstart Schools for their children.

Some inquires used to gather demographic information where asked such as whether the individual has received education beyond high school, if they owned rather than rented their home, and if they reside in a city or town. The results showed that 51% had some post-secondary education, 53% owned homes and 48% reside in a city or town rather than the outlying rural areas. They also found that 35% reported a landfill in their county and 21% reported a chemical plant in their county. The responses were also stratified by race to

determine if there was any significance in the types of response relative to the race of the individuals interviewed (Preston, 2000).

"Most survey respondents (75%) were African American, while 23% were Caucasian, and the remaining 2% were of other races/ethnicities (Preston 2000)". Majority of the heads of households were from ages 19-29 and completed high-school or received a GED. Also, 29% of the surveyed individuals had some college level education. The researchers decided to divide the individuals into two groups, those that had an education following high school and those that had the equivalent of a high school diploma or less.

They included questions such as whether the individuals reported chemical plants or incinerators in their counties. The also inquired if the interviewees knew what agency to contact if there were surface water or drinking water problems and whether or not the drinking water was monitored. The inquiry results show that of those reporting chemical plants in their county, 18% completed high school or less while 25% had an education past high school. Eighteen percent with an a high school education or less also reported an incinerator in their county while only 15% with an education beyond high school reported one in their county.

When considering the regulation of drinking water and whom to contact when there is a surface water or drinking water concern the results were as followed: Whether or not the drinking water is monitored? High school or less- 30%, more than high school- 39%; Agency to contact concerning surface water problems? High school or less-21%, more than high school-38%; Agency to contact concerning drinking water problems? High school or less-49%, more

than high school-62%. The researchers found some correlation between education level and overall environmental awareness.

Table 4 “exhibits that survey respondents who had education beyond high school were consistently more likely to be familiar with government agencies with responsibilities in the area of health and the environment” (Preston, 2000).

Note. Table 4: Reprinted from “Factors Affecting Environmental Awareness Among Head Start Families in Mississippi,” by Preston, Bejamin L.; Stewart, Peter; Warren, Rueben C. 2000, American Journal of Preventative Medicine. 19:174-179.

Agency	Total (%) (N=763)[a]	Caucasians (%) (n=169)[a]	African American (%) (n=561)	Other (%) (n=19)[a]	p	≤High school (%) (n=376)[a]	>High school (%) (n=387)[a]	p
U.S. Environmental Protection Agency	22	28	21	21	NS	16	27	<.001
U.S. Department of Health and Human Services	37	36	32	32	NS	33	41	<.05
Centers for Disease Control and Prevention	25	30	26	26	NS	18	32	<.0001
U.S. Department of the Interior	6	8	11	11	NS	5	8	NS
U.S. Department of Agriculture	23	22	32	32	NS	17	29	<.0001
Mississippi State Department of Health	38	37	42	42	NS	32	44	<.001
Mississippi Department of Environmental Quality	11	11	16	16	NS	8	14	<.01
Mississippi Wildlife, Fisheries, and Parks Department	26	23	48	48	NS	22	30	<.05
Mississippi Regional Poison Control Facility	20	27	32	32	NS	16	24	<.01
County Health Department	40	38	53	53	<.05	35	46	<.01

[a]Number of individuals from each category completing the survey. However, survey respondents did not necessarily respond to all inquiries.
NS, not significant

Although the research did indicate that some demographics such as education level may play a role in the extent to which an individual is environmentally aware, it was unable to prove it as such in relation to the proximity in which the individuals and their families reside to a facility that may affect their environment. “In addition, although 35% of respondents reported a landfill within their county, 1995 data from EPA’s Office of Solid Waste indicates that only three regulated municipal landfills exist within the MAP service area (in Lauderdale, Pearl River,

and Scott counties)…This may reflect a false perception of environmental hazards among this population and/or a general lack of familiarity with local polluting facilities" (Preston, 2000).

This study demonstrates that awareness is not only a predecessor to perception but perception may influence the extent of awareness in a negative fashion as well as the positive. This suggests a somewhat pessimistic perception among individuals. The fact that they believe they are living in some proximity to a landfill but are not may show that the individuals not only lack the familiarity with local polluting facilities but seem to have a preconceived notion that they expect something such as a landfill to be close to their residential area.

2.4 PERCEPTION OF RISKS

Perception is another component that may affect how individuals react to environmental hazards. It is how one essentially views a particular matter or their personal outlook on a subject. In particular this thesis will focus on the perception of the East Baton Rouge Parish's citizens in regard to pollution on at the local level. The different points of perception may vary from the positive to negative in different degrees. Each individual perception is different and can be shaped by factors such as awareness or experience. Therefore an understanding of the prominent outlooks among residents of the Parish is needed.

Many researchers believe that people do not generally have optimistic perspectives when it comes to environmental issues at the local level. Garcia-Mira quotes Ingold stating, "In the differentiation between global and local environments (1993), it is usually found that people are more concerned about global problems, over which they have less influence, than

local problems, on which they can act" (Garcia-Mira, 2005). This is called ''environmental hyperopia'' (Uzzell 2000; Uzzell et al. 1994 in Garcia, 2005).

There is also an ecological perspective to consider. This deals with "perspectives on the local level to understand individuals in the context of a series of environments or ecological systems in which they reside" (Brooks-Gunn et al. 1993 in Ohmer, 2010). An important concept arising from the ecological perspective is that of the ''goodness-of-fit'' between people and their environments. "Goodness-of-fit suggests that nutritive environments provide the necessary resources, security, and support at the appropriate times in the appropriate ways, but hostile environments inhibit development and the ability to cope owing to a lack or distortion of environmental supports" (Greene 1999 in Ohmer, 2010). Ohmer further elaborates stating that, "Poor, disadvantaged neighborhoods are frequently hostile environments wherein children and families deal with negative life situations, such as crime, poverty, unemployment, decay, and social isolation" (Ohmer, 2010). Individuals living in more hostile environments may influence change by becoming involved.

When dealing specifically with environmental issues within the community another perspective to take into consideration is collective outcome efficacy, which is the perceived effectiveness of one's group to affect a change in an environmental problem (Bonniface and Henley, 2008). The stance an individual may take when dealing with environmental issues may depend on their surroundings and the amount in which they participate in community activities. Leesa Boniface and Nadine Henley found that individuals who participate in community activities have a stronger belief in collective outcome efficacy (the ability of one's

group to work) but do not believe in the community's collective efficacy (the effectiveness of one's group to work). Collective outcome efficacy basically looks at the perception of the potential work that could be completed by the work of a group, while collective efficacy looks at the effectiveness of a group and the work they do. Table 5 depicts the interview results in a manner of whether belief was high or low for the interviewees, which were divided into groups of group activist, individual activists, and non-activists.

Note. Table 5: Reprinted from. "A drop in the bucket: Collective efficacy perceptions and environmental behavior," by Lisa Bonniface, Lisa and Nadine Henley, Nadine. 2008 Australian Journal of Social Issues. 43:345-358.

	Collective Efficacy	Collective Outcome Efficacy
Group Activists	Low	High
Independent Activists	Low	High
Non-activists	Low	Low

This research demonstrates how individuals who are more involved have a tendency to believe in the potential outcome of collective efficacy whereas non-activists seem to believe that participation would be ineffective. Non-activist believe their participation would be just a "drop in a bucket" and that there would not be enough drops to fill that bucket even if there were a vast amount of participation; whereas activist believe they are a drop in the bucket but if others contribute their drop the bucket could be filled (Bonniface and Henley, 2008).

The importance of perception can be summarized in the research of Karen Bickerstaff and Gordon Walker after completing a study on public understanding of air pollution. They deduced that if we are to secure significant improvement in national and even global air quality

an intrinsic knowledge of people's perceptions and wider value judgments is essential (Bickerstaff and Walker, 2001).

Based on this examination of related research, these factors are quantified and included as potential influences on the adaptive behaviors examined in this study:

- Socioeconomic attributes
- Membership in a local environmental group
- Knowledge of risks
- Perception of risks
- Confidence of effectiveness of risk-reducing actions

CHAPTER 3. DATA AND METHODS

In order to evaluate the exposure reducing adaptations, 64 in-depth interviews were conducted with attendees of the East Baton Rouge Parish Metro City Council public meetings during 2010 and 2011. The interviews were used to determine activities and attitudes concerning several exposure-reducing behaviors. The interview questions are shown in Appendix A.

Respondents were selected solely on their willingness to participate and different public meetings were chosen to ensure the inclusion of individuals from different communities within the parish. Four researchers conducted the interviews and each interview lasted approximately 30 minutes. There were sixteen questions that garnered information regarding demographics (education level, age group, sex, household size) and also questions to indicate exposure and experience with past environmental emergencies (zip code of residence to locate TRI facilities); socio-economic vulnerability; capacity to take steps to reduce environmental exposure risks.

Interviews were transcribed and the responses of each interview were examined to ascertain what may contribute to adaptive behavior by different respondents. Three dependent variables were established which were all relevant to individual adaptive behavior: does the individual have a household emergency plan, do they check daily air ratings, and does the does the individual change outdoor activities due to air quality. Independent variables were also established and they can be classified as: demographic, risk exposure potential, knowledge of risk and community involvement. The variables are found in Table 6.

The TRI report for each zip code represented by the interviewees was obtained on the Environmental Protection Agency's website (http://www.epa.gov/tri/). This data was collected to give an indication of actual exposure risks from TRI reporting facilities within zip code of respondents.

Table 6- Variables for Anyalysis From Community Interviews

Variable	Dependent or Independent Variable	Classification	Type
Age	Independent	Demographic	Ordinal
Education	Independent	Demographic	Ordinal
Income	Independent	Demographic	Ordinal
Hazardous emergency plan	Dependent	Adaptive Behavior	Nominal
Informed	Independent	Attitudes and Knowledge of Risks	Nominal
Years at Current Zip Code	Independent	Demographic	Interval
Local Group	Independent	Community Involvement	Nominal
Env. Hazard in Last 5 years	Independent	Risk Exposure Potential	Nominal
Aware of Daily Air Ratings	Independent	Attitude and Knowledge of Risks	Nominal
Check Daily Air Ratings	Dependent	Adaptive Behavior	Nominal
Change Outdoor Activities Due to Air Quality	Dependent	Adaptive Behavior	Nominal
TRI Facility within Zip Code	Independent	Risk Exposure Potential	Nominal
TotaTRI	Independent	Risk Exposure Potential	Interval

To identify significant associations or correlations among the three adaptive behaviors and the independent variables, a bi-variate correlation analysis was conducted, using the non-parametric measure of association, the Spearman's rank correlation coefficient (or Spearman's rho).

At this point there was an analysis to determine possible statistically significant associations among variables using the crosstabs method. One of the primary adaptive behaviors, the adoption of an emergency plan, is answered with either a "yes or no" classifying it as dichotomous variable. The crosstabs tests were used to find associations between a dichotomous variable and three variable types: nominal, ordinal, and interval.

The test used to determine a statistically significant association between "plan adoption" and each of the other variables is different depending on whether we're looking at "plan" with nominal variable (yes/no questions), ordinal variables (measured on a Likert scale from one to five), or continuous variables (such as the TRI emissions for the zip code and length of years at residence). All analyses were run using SPSS 15.0.

CHAPTER 4. RESULTS

In order to determine what factors may influence exposure reducing adaptations among Baton Rouge residents the responses of 64 interviewees were studied. The use of a qualitative approach facilitates the exploration of phenomena in relation to experiences in daily life (Eyles 1998; Elliott 1999 in Wakefield et. al., 2001). The interview responses were put into qualitative rankings (if they were not quantitative) and all results were analyzed to determine any significant associations. The adaptive behaviors of interest were: checking the daily air readings, reducing outdoor activities on the days of bad readings, and the adoption of household emergency plans in the occurrence of an environmentally hazardous incident. Adoption of a household emergency response plan was selected as the main adaptive strategy to be examined in the analyses.

Table 7 gives the mean of each interview response in relation to whether or not the interviewee had adopted a household emergency plan. Correlation tests were run using the Kendall's crosstabs method in SPSS to find significant associations between having a "Plan" and the ordinal variables. The table below (Table 8) lists the significant correlations found with plan adoption and variables that are measure on a Likert scale from one to five. These significant correlations indicate which factors are associated with, and may influence the adoption of a household emergency plan.

Table 7: Means of Each Interview Response In Relation To the Adoption of an Emergency Plan

	Plan	N	Mean	Std. Deviation	Std. Error Mean
Age	0	47	4.13	1.377	.201
	1	15	4.33	1.113	.287
Ed	0	47	3.23	.865	.126
	1	15	2.60	.910	.235
Income	0	40	3.53	1.358	.215
	1	12	3.17	1.403	.405
FiveYears	0	44	.91	.960	.145
	1	13	.62	.768	.213
CheckAir	0	40	2.25	1.256	.199
	1	14	3.43	1.342	.359
Contact	0	46	.22	.417	.061
	1	14	.64	.497	.133
Informed	0	41	2.00	1.140	.178
	1	12	3.00	.953	.275
YRSatZip	0	39	23.95	21.634	3.464
	1	14	34.57	19.222	5.137
TotalTRI	0	46	304390.8	1495555.285	220507.6
	1	15	263444.1	452223.92500	116763.7
CommAct	0	13	1.77	2.006	.556
	1	10	2.60	1.955	.618

Table 8- Significant Correlations Between Having a "Plan" and Ordinal Variables (Kendall's tau-b)

Variable*Plan (Kendall's Tau-b)	Value	Asymp. Std. Error	Approx. T.	Approx. Sig.
Education	-.296	.106	-2.601	.009
Age	.060	.115	.521	.602
Children	-.091	.110	-.811	.417
Housesize	-.032	.151	-.208	.836
Income	-.089	.123	-.715	.475
Informed	.356	.105	3.022	.003
Check Air	.348	.112	2.904	.004
Soil	.173	.119	1.417	.157
Water	.105	.119	.873	.382
Air	.146	.124	1.159	.246

Among the nominal variables, there were few significant findings. In fact, only three variables, "education", "informed", and "Check Air Quality Daily", were found to have a statistically significant correlation with the adoption of a household emergency plan in the

event of an environmental accident like a chemical leak or explosion at a petro-chemical manufacturing facility. Surprisingly, educational attainment was inversely associated with plan adoption. This is somewhat surprising and shows a contradiction to what is generally believed for socio-economics. The results also show that those who do demonstrate adaptive behavior are the ones who feel they are "informed" and also make day to day adjustments such as "Checking the Air Quality" daily.

Next tests were run to determine whether there were any significant associations between the dichotomous variable, "Plan," and the nominal variables (answered as "yes" or "no") using Phi Cramer's crosstabs method.

Table 9- Significant Correlations Between Having a "Plan" and Nominal Variables (Phi Cramer's V)

Variable*Plan (Phi Cramer's V)	Value (Phi)	Approx. Sig. (Phi)	Value (Cramer's V)	Approx. Sig. (Cramer's V)
Gender	.077	.546	.077	.546
FiveYrs	.304	.072	.304	.072
DailyAir	.308	.019	.308	.019
LocalGroup	-.054	.688	.054	.688
AirPlan	.122	.358	.122	.358

The tests revealed that there is some significant association between the adoption of an emergency plan and having had an environmental emergency in the past five years within the zip code (Phi Cramer's V=.304, p= .072). The crosstabs test also yielded a significance level of .308 (Phi Cramer's V) between whether the interviewees are aware of the daily air quality ratings ("Daily Air") and whether they had adopted an emergency plan. The Cramer's crosstabs test indicated no significant associations between "Plan" and the other nominal variables.

The final test that indicated some significant results was the Chi square crosstabs test. The test was run between "Plan" and the "continuous" variables: YRSatZIP, and TotalTRI. Here significant associations were found between "YRSatZIP" and "Plan" (Spearman's correlation= .262, p=.058).

Table 10: Crosstabs between Plan and Years at Zip (Interval Variables)

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.221	.124	1.620	.111[c]
Ordinal by Ordinal	Spearman Correlation	.262	.114	1.937	.058[c]
N of Valid Cases		53			

As shown in Table 11, no other significant associations were indicated between "Plan" and the other continuous variable, total TRI emissions reported within the interviewee's zip code.

Table 11: Crosstabs between Plan and TotalTRI in Zip (Interval Variables)

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.014	.076	-.104	.918[c]
Ordinal by Ordinal	Spearman Correlation	.184	.144	1.440	.155[c]
N of Valid Cases		61			

However, these results may be influenced to some degree by the small numbers of interviewees living in zip codes with TRI-regulated facilities. Among the 64 interviewees, only nine resided within a zip code that had at least one facility that reports releases for the Toxic Release Inventory. Of the remaining individuals 52 do not reside in a zip code containing a TRI facility and 3 would not provide their zip code. Although the crosstab analysis did not yield a significant association between TRI totals and plan adoption, there is some evidence in the data that proximity to TRI-regulated facilities may encourage plan adoption. Forty-four percent of those living in a TRI zip code had adopted a household plan, whereas only about 21% of residents of zip codes with no TRI emissions reported adoption of a household emergency plan.

4.1 DISCUSSION

This research was conducted to identify factors that may influence adaptive behavior among Baton Rouge citizens to reduce their exposure risks due to environmental hazards. While some researchers have found that demographics and socio-economics attributes of residents are related to overall environmental awareness, risk-perceptions, and adoption of risk-reducing adaptations, these interviews demonstrated that is not always the case. For instance, demographics factors such as age and gender did not appear to be associated with risk-reducing behaviors in this preliminary study.

The Kendall's crosstabs analysis indicated a surprising finding by indicating that those who are less educated tend to show more adaptive behavior such as adopting an emergency plan. Also those who believe that they are adequately informed, or are aware of the daily air ratings and check them, are more likely to have a household emergency plan in the event of potential exposure to an environmental hazard. This shows that there probably is some

crossover effect from one adaptive behavior to another, and that it is those who stay informed that exhibit the capacity to take steps to reduce environmental exposure risks. It seems that those who have adapted to reduce their exposure risks when the air quality is bad also have adapted to the prospect of other events and accidents that could expose them to an environmental hazard.

The Cramer's crosstabs analysis between adopting a "plan" and the "yes/no" questions also indicated some significant findings. These crosstabs show that there is some significant association between having an emergency plan and whether or not they are aware of the daily air quality ratings. One of the more notable associations is the indication that those who have had an incident in the past five years have an emergency plan implemented in their household. This indicates some adaptation by those individuals following a major disturbance possibly increasing the resilience of those who have been previously exposed to an environmental hazard.

The crosstabs between plan and the interval variables indicated that there is one continuous variable which is "YRSatZIP" that shows some significance with having an emergency plan. Those individuals who have resided in the area longer are more likely to have adopted a household plan in the event of an environmental emergency. This suggests that these residents are more established in the community, have stronger social and economic ties, and have more historical memory and awareness of the environmental challenges facing their community. Although membership in local environmental groups was not found to be associated with emergency plan adoption, this finding suggests that residents who have lived

longer in the area may be deriving some of the benefits of group membership that were pointed out in earlier studies, including Bonneface and Hennley (2008).

CHAPTER 5. CONCLUSION

5.1 SUMMARY

This research examined attitudes and behaviors of residents of East Baton Rouge Parish to determine: To what extent are they taking steps to reduce environmental exposure risks? What factors may influence adoption of exposure-reducing behavior? The "adaptive behaviors" were determined as: the adoption of a household emergency plan, more frequent checking of daily air quality ratings, and changing plans for outdoor activities on bad air-quality days. The influences examined were socio-economic attributes of residents, membership in environmental groups, experience with past environmental emergencies, TRI emissions within the community, knowledge of local environmental hazards, and confidence in respondents' abilities to reduce risks. This research was conducted to gain insights that can be used to design better environmental education and public health outreach programs for residents of Louisiana's upper Industrial Corridor and similar communities throughout the country.

First the findings suggest that adoption of risk-reducing behaviors among these residents is not widely spread, and therefore, the opportunity exists for more vigorous and targeted public education and outreach efforts. Second, several key contextual factors were found to be associated with adoption of a household emergency response plan in case of an event like a chemical leak or plant explosion.

Somewhat surprisingly, there was no indication that residents who had adopted emergency plans are more affluent or better educated than those who had not taken this step to reduce exposure risks to environmental hazards. Actually, in this sample those residents

who had adopted a household emergency plan tended to have a lower level of educational attainment, whereas studies such as that conducted by Benjamin Preston, Peter Stewart, and Rueben Warren that found significant associations between demographics, socio-economics, and environmental awareness and preparedness (Preston, Stewart, and Warren, 2000). The finding here may be related to the fact that East Baton Rouge Parish residents who had experienced an environmental emergency within their neighborhood during the last five years were found to be more likely to have adopted a household emergency response plan. In this area of the upper Industrial Corridor, neighborhoods nearer manufacturing plants, waste-disposal facilities, and the highways and railroads that carry hazardous cargo may be home to residents with less education.

Other factors found to be associated with household-level emergency planning were longer length of residence within the immediate area, and having adopted other risk-reducing behaviors. Perhaps the most significant results are that residents who believe that they are well-informed about risk-reducing strategies are more likely to have adopted the household emergency response plan. This emphasizes the important role to be played by well-designed environmental health outreach and education programs. There is a wealth of environmental health-related public information available to reduce exposure from a variety of sources. According to these findings, it is those who have this information who are benefiting from it and showing adaptive behavior.

5.2 SUGGESTIONS FOR FUTURE RESEARCH

The grounds for future research in this subject matter are almost limitless and this preliminary examination can be used to design a larger-scale study. First, the number of individuals interviewed could be expanded. Although many of the zip codes in East Baton Rouge Parish were represented, there were some that were not due to the lack of people from those areas attending the East Baton Rouge Metro Council District meetings. Those residents who attend their district meetings probably tend to be older and more affluent than their fellow district members who do not attend the public meetings. Also, a larger randomly selected pool of residents from the area should yield results even more reflective of the population of residents living in similar communities facing cumulative environmental exposure risks. The increase in numbers could be accommodated by administering a short survey rather than a lengthy interview. This would make the data collection more accommodating to the individuals interviewed and possibly increase willingness to participate in the study.

Another approach for improvement would be to interview individuals that live along the industrial corridor only. This would allow for research that could concentrate on the more heavily affected areas and whether or not those individuals are coping with their circumstances through adaptation. Discovering whether steps are being taken to adapt in Baton Rouge should help ascertain whether the information made available to help the citizens of the parish that are more likely to be affected by an environmental emergency is being relayed effectively.

A third concept for future research consideration is to examine various methods of environmental health public education and outreach to the communities within Baton Rouge. For example, in recent years there has been a noticeable increase in the use of technology to

inform the general population. Although the local and state agencies and interest groups do utilize technology to communicate, to some extent, the current methods may be ineffective. What would be the purpose of having a phone or computer application that would instantaneously send citizens daily air readings if they do not know it is available? One particular study by Huseyin Uzunboylu focused on utilizing mobile technologies to educate students on environmental issues. He found that "following the use of mobile technologies (SMS, MMS, electronic mail, messenger) students observed environments more carefully, increasing their awareness of environmental blights" (Uzunboylu 2009). This could be applied to Baton Rouge at a broader scale for not only the students living in Baton Rouge but everyone. A study to determine if the citizens know where to obtain information and what would be the best method of promoting the information would help educational outreach programs effectively relay information without wasting monetary resources. According to Uzunboylu, there should be a crossover from many types of media learning to make sure all everyone understands where they could receive the information.

Principally, the emphasis of future research should be to develop the most effective methods to inform the community. To simply have a community outreach program today is not enough. There should be a systematic approach as to who outreach programs are dealing with and how best to reach them. To raise awareness is the key to ensure adaptive behavior and the only way to do that is to understand and bridge communication gaps and make sure the residents of Baton Rouge are staying informed of potential risks and are clear on the specific actions they can take to make themselves safer.

BIBLIOGRAPHY

Abel, N., Cumming, D.H.M., and Anderies, J.M. 2006. Collapse and reorganization in social ecological systems: questions, some ideas, and policy implications. Ecology & Society 11:17.

Bary, D. and Hubbard, J. 2011. EPA approved redesignation of baton rouge area to attainment for ozon. Accessed January 30, 2012. http://yosemite.epa.gov/opa/admpress.nsf/0/13F29FA0FB685F25852579490063E6CE

Baton Rouge Clean Air Coalition. 2011. Taking action. Accessed December 3, 2011. http://www.brcleanair.com/action/

Bickerstaff, K. and Walker, G. 2001. Public understandings of air pollution: the 'localisation' of environmental risk. Global Environmental Change. 11:133-145.

Boeglin, M., Wessels, D., Henshel, D. 2006. An investigation of the relationship between air emissions of volatile organic compounds and the incidence of cancer in Indiana counties. Environmental Research.100:242-254.

Bonniface, L. and Henley, N. 2008. 'A drop in the bucket': collective efficacy perceptions and environmental behavior. Australian Journal of Social Issues. 43:345-358.

Bullard, R.D. and Johnson, G.S. 2000. Environmental justice: grassroots activism and its impact on public policy decision making. Journal of Social Issues. 56:555–578.

Carpenter, S., Walker, B., Anderies, J.M., and Abel, N. 2001. From metaphor to measurement: resilience of what to what. Ecosystems 4:765-781.

Cutter, S.L. 1996. Vulnerability to environmental hazards. Progress in Human Geography 20: 529-539.

Elliott, S.J., Cole, D.C., Kruger, P., Voorberg, N., Wakefield, S. 1999. The power of perception: health risk attributed to air pollution in an urban industrial neighbourhood. Risk Analysis. 19:621-634.

Environmental Protection Agency. 2011. TRI explorer: Louisiana 2010 state fact sheet. Accessed February 15,2011.http://iaspub.epa.gov/triexplorer/tri_broker_statefs.broker?p_view=STCO&trilib=TRIQ1&state=LA&SFS=YES&year=2010

Environmental Protection Agency. 2011. Ground level ozone: health. Accessed November 13,2011. http://www.epa.gov/air/ozonepollution/health.html

Garcia-Mira, R., Real, J.E., Romay, J. 2005. Temporal and spatial dimensions in the perception of environmental problems: an investigation of the concept of environmental hyperopia. INTERNATIONAL JOURNAL OF PSYCHOLOGY. 40:5–10

Gunderson, L.H. 2000. Ecological resilience – in theory and application. Annual Review of Ecology and Systematics 31:425-39.

Holling, C.S. 1996. Surprise for science, resilience for ecosystems, and incentives for people. Ecological Applications 6:733-735.

Kaufman, M.M. 1995. Community response to stormwater pollution in an urbanized watershed. Water Resources Bulletin. 31:491-504.

Louisiana Department of Environmental Quality. 2011. Ozone action program. Accessed August 11, 2011. http://deq.state.la.us/portal/PROGRAMS/OzoneActionProgram.aspx

Mayor's Office of Homeland Security and Emergency Preparedness. 2011. Emergency preparedness. Accessed January 12, 2012. http://www.brgov.com/dept/oep

Nelson, D.R., Adger, W.N., Brown, K. 2007. Adaptation to environmental change: contributions of a resilience framework. The Annual Review of Environment and Resources. 32:395-419.

Ohmer, M.L. 2010. How theory and research inform citizen participation in poor communities: the ecological perspective and theories on self- and collective efficacy and sense of community. Journal of Human Behavior in the Social Environment. 20:1 19. Accessed April 27, 2011. DOI: 10.1080/10911350903126999.

Pimm, S. 1991. The balance of nature? University of Chicago Press, Chicago, Illinois.

Preston, B.L.,Stewart, P., Warren, R.C. 2000. Factors affecting environmental awareness among head start families in mississippi. American Journal of Preventative Medicine. 19:174 179.

Thomas, C. 1999. From red stick to river capital: three centuries of baton rouge history. Accessed July 25, 2011. http://www.lib.lsu.edu/special/exhibits/e exhibits/redstick/brex2.html#top

Uzunboylu, H., Cavus, N., Ercag, E.,. 2009. Using mobile learning to increase environmental awareness. Computers and Education. 52:381-389.

Wakefield, S.E.L.,Cole, D.C., Elliot, S. J.,Eyles, J.D. 2001. Environmental risk and (re)action: air quality, health, and civic involvement in an urban industrial neighbourhood. Health & Place. 7:163-177.

Walker, B.H., Anderies, J.M., Kinzig, A.P., and Ryan, P. 2006. Exploring resilience in social ecological systems through comparative studies and theory development: introduction to the special issue. Ecology and Society 11:12.

APPENDIX A: COMMUNITY ENVIRONMENTAL ISSUES INTERVIEW QUESTIONS

Community Environmental Issues Interview

The purpose of this interview is to identify the environmental topics of most concern to you and your neighbors. The results will help us design our LSU Superfund Research Center Community Engagement program to better address your needs. If you have any questions concerning answering this interview, feel free to contact me at: mreams@lsu.edu or Dr. Robert C. Mathews, Chairman of the LSU Institutional Review Board at (225)578-8692 or irb@lsu.edu. Answering these questions is voluntary and all responses are anonymous. By answering the questions in this interview you are providing and documenting your consent to participate in this research project.

Thank you,

Margaret Reams, Ph.D.
Community Engagement Leader, LSU Superfund Research Center &
Associate Professor, LSU Department of Environmental Sciences

1. What is your gender? Male Female

2. What is your age? 18-30 years 31-40 years 41-50 years 51-60 years 61 plus years

3. What is your highest level of education?

Some High-school GED/High-school Diploma

BA/BS College Degree Post-graduate Degree

4. What is your household size? (Please circle one answer)

1-3 persons 4-6 persons 7-10 persons More than 10 persons

5. How many children under the age of 18 live in your household? _______

6. What is your occupation? _________________________________

7. What is your average monthly income? (Please circle one answer)

Less than $1,000/month $2,501-$4,000/month

$1,000-$2,500/month $4,001-$5,500/month More than $5,501/month

8. Do you know whom to contact in the event of an environmental hazard emergency?

YES NO If yes, please list ____

9. Do you have a household emergency plan in the event of an environmental hazard? YES NO

10. To what extend do you feel you are informed of actions to take in the event of an environmental hazard emergency? (1 is "not informed at all"; 5 is "fully informed") Please circle one.

1 2 3 4 5

11. What is the best way to inform you of an environmental hazard emergency? (Please circle all that apply)

Television
Radio
Home/Work Phone
Cell Phone/Text Message
Other, please list ________________________________

12. Has there been an emergency event involving hazardous materials in your community within the past 5 years?

YES NO Don't Know

If yes, who/what was the cause of the emergency? ___________________________________

13. Are you aware of the daily rating for air quality in Baton Rouge? YES NO

If yes, how often do you check the daily rating for air quality in Baton Rouge? (Circle One)

1 (Never) 2 (Seldom) 3 (Sometimes) 4 (Frequently) 5 (Always)

Have you ever changed your planned outdoor activities because of air quality conditions? YES NO

14. Do you participate in any local groups that deal with environmental issues in your community? (Please circle one answer)

Yes No If yes, please list: ____

15. What is your zip code? _________ How many years have you resided in this zip- code area? _____

16. In general for your area, how would you rate the following? (1 being "VERY BAD", and 5 being "EXCELLENT")

Air Quality	1	2	3	4	5	Do not know
Soil Quality	1	2	3	4	5	Do not know
Water Quality	1	2	3	4	5	Do not know
Green Space	1	2	3	4	5	Do not know

APPENDIX B: INTERVIEW DATA ANALYSIS

T-Test

Group Statistics

	Plan	N	Mean	Std. Deviation	Std. Error Mean
Age	0	47	4.13	1.377	.201
	1	15	4.33	1.113	.287
Ed	0	47	3.23	.865	.126
	1	15	2.60	.910	.235
Income	0	40	3.53	1.358	.215
	1	12	3.17	1.403	.405
FiveYears	0	44	.91	.960	.145
	1	13	.62	.768	.213
CheckAir	0	40	2.25	1.256	.199
	1	14	3.43	1.342	.359
Contact	0	46	.22	.417	.061
	1	14	.64	.497	.133
Informed	0	41	2.00	1.140	.178
	1	12	3.00	.953	.275
YRSatZip	0	39	23.95	21.634	3.464
	1	14	34.57	19.222	5.137
TotalTRI	0	46	304390.8	1495555.285	220507.6
	1	15	263444.1	452223.92500	116763.7
CommAct	0	13	1.77	2.006	.556
	1	10	2.60	1.955	.618

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Age	Equal variances assumed	.368	.546	-.525	60	.601	-.206	.391	-.989	.577
	Equal variances not assumed			-.587	28.929	.562	-.206	.351	-.923	.511
Ed	Equal variances assumed	.169	.683	2.441	60	.018	.634	.260	.115	1.154
	Equal variances not assumed			2.377	22.662	.026	.634	.267	.082	1.186
Income	Equal variances assumed	.655	.422	.796	50	.430	.358	.450	-.546	1.263
	Equal variances not assumed			.781	17.659	.445	.358	.459	-.606	1.323
FiveYears	Equal variances assumed	7.220	.010	1.010	55	.317	.294	.291	-.289	.877
	Equal variances not assumed			1.141	24.202	.265	.294	.258	-.238	.825
CheckAir	Equal variances assumed	.175	.678	-2.970	52	.005	-1.179	.397	-1.975	-.382
	Equal variances not assumed			-2.874	21.509	.009	-1.179	.410	-2.030	-.327
Contact	Equal variances assumed	3.187	.079	-3.195	58	.002	-.425	.133	-.692	-.159
	Equal variances not assumed			-2.906	18.911	.009	-.425	.146	-.732	-.119
Informed	Equal variances assumed	.844	.363	-2.763	51	.008	-1.000	.362	-1.727	-.273
	Equal variances not assumed			-3.050	21.117	.006	-1.000	.328	-1.682	-.318
YRSatZip	Equal variances assumed	1.113	.296	-1.620	51	.111	-10.623	6.557	-23.787	2.541
	Equal variances not assumed			-1.714	25.693	.099	-10.623	6.196	-23.367	2.121
TotalTRI	Equal variances assumed	.186	.668	.104	59	.918	40946.628	393834.53	-747114	829007.7
	Equal variances not assumed			.164	58.891	.870	40946.628	249514.26	-458350	540242.8
CommAct	Equal variances assumed	.042	.840	-.995	21	.331	-.831	.835	-2.567	.905
	Equal variances not assumed			-.999	19.762	.330	-.831	.832	-2.567	.906

Frequencies

[DataSet1] C:\Program Files\SPSS\Corrinthia's Community Survey Data Pt. 2.sav

Statistics

		Gender	Age	Ed	Housesize	Children	Income	Soil	Water	Air	Contact	Plan	Informed	FiveYears	DailyAir	CheckAir	AirPlan	LocalGrp	Zip	YRSatZip	TotalTRI
N	Valid	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	56	53	62
	Missing	0	0	0	1	0	10	7	7	6	2	1	9	6	5	9	6	7	7	10	1
Mean		1.54	4.19	3.05	1.02	.19	3.40	2.36	3.38	2.86	.31	.24	2.20	.84	.67	2.56	.37	.11	70799.38	26.75	289574.8
Median		2.00	5.00	3.00	1.00	.00	3.00	3.00	4.00	3.00	.00	.00	2.00	.00	1.00	3.00	.00	.00	70806.00	23.00	.0000
Std. Deviation		.502	1.306	.941	.286	.564	1.391	1.803	1.743	1.684	.467	.432	1.172	.922	.473	1.369	.487	.312	21.431	21.372	1303326
Variance		.252	1.705	.885	.082	.318	1.936	3.252	3.039	2.837	.218	.186	1.373	.850	.224	1.874	.237	.097	459.293	456.766	2E+012

Frequency Table

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	29	46.0	46.0	46.0
	2	34	54.0	54.0	100.0
	Total	63	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	9.5	9.5	9.5
	2	3	4.8	4.8	14.3
	3	3	4.8	4.8	19.0
	4	12	19.0	19.0	38.1
	5	39	61.9	61.9	100.0
	Total	63	100.0	100.0	

Ed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	1.6	1.6	1.6
	1	3	4.8	4.8	6.3
	2	11	17.5	17.5	23.8
	3	25	39.7	39.7	63.5
	4	23	36.5	36.5	100.0
	Total	63	100.0	100.0	

Housesize

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	3.2	3.2	3.2
	1	57	90.5	91.9	95.2
	2	3	4.8	4.8	100.0
	Total	62	98.4	100.0	
Missing	System	1	1.6		
Total		63	100.0		

Children

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	55	87.3	87.3	87.3
	1	5	7.9	7.9	95.2
	2	2	3.2	3.2	98.4
	3	1	1.6	1.6	100.0
	Total	63	100.0	100.0	

Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	7.9	9.4	9.4
	2	11	17.5	20.8	30.2
	3	13	20.6	24.5	54.7
	4	6	9.5	11.3	66.0
	5	18	28.6	34.0	100.0
	Total	53	84.1	100.0	
Missing	System	10	15.9		
Total		63	100.0		

Soil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	16	25.4	28.6	28.6
	1	5	7.9	8.9	37.5
	2	2	3.2	3.6	41.1
	3	15	23.8	26.8	67.9
	4	12	19.0	21.4	89.3
	5	6	9.5	10.7	100.0
	Total	56	88.9	100.0	
Missing	System	7	11.1		
Total		63	100.0		

Water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	11.1	12.5	12.5
	1	3	4.8	5.4	17.9
	2	6	9.5	10.7	28.6
	3	6	9.5	10.7	39.3
	4	14	22.2	25.0	64.3
	5	20	31.7	35.7	100.0
	Total	56	88.9	100.0	
Missing	System	7	11.1		
Total		63	100.0		

Air

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	9	14.3	15.8	15.8
	1	4	6.3	7.0	22.8
	2	7	11.1	12.3	35.1
	3	14	22.2	24.6	59.6
	4	12	19.0	21.1	80.7
	5	11	17.5	19.3	100.0
	Total	57	90.5	100.0	
Missing	System	6	9.5		
Total		63	100.0		

Contact

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	42	66.7	68.9	68.9
	1	19	30.2	31.1	100.0
	Total	61	96.8	100.0	
Missing	System	2	3.2		
Total		63	100.0		

Plan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	47	74.6	75.8	75.8
	1	15	23.8	24.2	100.0
	Total	62	98.4	100.0	
Missing	System	1	1.6		
Total		63	100.0		

Informed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	20	31.7	37.0	37.0
	2	13	20.6	24.1	61.1
	3	13	20.6	24.1	85.2
	4	6	9.5	11.1	96.3
	5	2	3.2	3.7	100.0
	Total	54	85.7	100.0	
Missing	System	9	14.3		
Total		63	100.0		

FiveYears

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	46.0	50.9	50.9
	1	8	12.7	14.0	64.9
	2	20	31.7	35.1	100.0
	Total	57	90.5	100.0	
Missing	System	6	9.5		
Total		63	100.0		

DailyAir

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	30.2	32.8	32.8
	1	39	61.9	67.2	100.0
	Total	58	92.1	100.0	
Missing	System	5	7.9		
Total		63	100.0		

CheckAir

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	1.6	1.9	1.9
	1	16	25.4	29.6	31.5
	2	8	12.7	14.8	46.3
	3	15	23.8	27.8	74.1
	4	9	14.3	16.7	90.7
	5	5	7.9	9.3	100.0
	Total	54	85.7	100.0	
Missing	System	9	14.3		
Total		63	100.0		

AirPlan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	36	57.1	63.2	63.2
	1	21	33.3	36.8	100.0
	Total	57	90.5	100.0	
Missing	System	6	9.5		
Total		63	100.0		

LocalGrp

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	50	79.4	89.3	89.3
	1	6	9.5	10.7	100.0
	Total	56	88.9	100.0	
Missing	System	7	11.1		
Total		63	100.0		

Zip

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	70714	3	4.8	5.4	5.4
	70777	1	1.6	1.8	7.1
	70791	6	9.5	10.7	17.9
	70802	1	1.6	1.8	19.6
	70805	1	1.6	1.8	21.4
	70806	35	55.6	62.5	83.9
	70807	2	3.2	3.6	87.5
	70808	2	3.2	3.6	91.1
	70809	1	1.6	1.8	92.9
	70811	4	6.3	7.1	100.0
	Total	56	88.9	100.0	
Missing	System	7	11.1		
Total		63	100.0		

YRSatZip

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	4.8	5.7	5.7
	2	3	4.8	5.7	11.3
	3	2	3.2	3.8	15.1
	5	1	1.6	1.9	17.0
	7	2	3.2	3.8	20.8
	8	1	1.6	1.9	22.6
	9	2	3.2	3.8	26.4
	10	3	4.8	5.7	32.1
	11	2	3.2	3.8	35.8
	13	1	1.6	1.9	37.7
	15	3	4.8	5.7	43.4
	16	1	1.6	1.9	45.3
	17	1	1.6	1.9	47.2
	20	1	1.6	1.9	49.1
	23	1	1.6	1.9	50.9
	25	1	1.6	1.9	52.8
	26	1	1.6	1.9	54.7
	27	1	1.6	1.9	56.6
	30	1	1.6	1.9	58.5
	31	1	1.6	1.9	60.4
	33	1	1.6	1.9	62.3
	34	1	1.6	1.9	64.2
	35	1	1.6	1.9	66.0
	36	1	1.6	1.9	67.9
	40	4	6.3	7.5	75.5
	41	1	1.6	1.9	77.4
	43	1	1.6	1.9	79.2
	44	1	1.6	1.9	81.1
	47	1	1.6	1.9	83.0
	49	1	1.6	1.9	84.9
	53	1	1.6	1.9	86.8
	55	1	1.6	1.9	88.7
	58	1	1.6	1.9	90.6
	60	1	1.6	1.9	92.5
	64	2	3.2	3.8	96.2
	78	1	1.6	1.9	98.1
	79	1	1.6	1.9	100.0
	Total	53	84.1	100.0	
Missing	System	10	15.9		

Total TRI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	53	84.1	85.5	85.5
	983588.00	6	9.5	9.7	95.2
	1000898.00	2	3.2	3.2	98.4
	10050313.00	1	1.6	1.6	100.0
	Total	62	98.4	100.0	
Missing	System	1	1.6		
Total		63	100.0		

Nonparametric Correlations

Notes

Output Created		17-OCT-2011 18:32:44
Comments		
Input	Data	C:\Program Files\SPSS\Corrinthia's Community Survey Data Pt. 2.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	63
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
Syntax		NONPAR CORR /VARIABLES=Gender Age Ed Housesize Children Income Soil Water Air Contact Plan Informed FiveYears DailyAir CheckAir AirPlan LocalGrp YRSatZip TotalTRI /PRINT=BOTH TWOTAIL NOSIG /MISSING=PAIRWISE .
Resources	Processor Time	0:00:00.08
	Elapsed Time	0:00:00.08
	Number of Cases Allowed	36602 cases(a)

(a) Based on availability of workspace memory

Correlations

		Gender	Age	Ed	Housesize	Children	Income	Soil	Water	Air	Contact	Plan	Informed	FiveYears	DailyAir	CheckAir	AirPlan	LocalGrp	YRSatZip	TotalTRI
Gender	Correlation Coefficient	1.000	-.057	.083	-.175	.142	-.301(*)	-.007	.097	.038	-.233	.077	-.242	.068	-.013	.011	.142	-.128	-.008	.109
	Sig. (2-tailed)	.	.634	.481	.168	.257	.017	.953	.425	.751	.071	.549	.054	.597	.924	.929	.288	.343	.943	.386
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Age	Correlation Coefficient	-.057	1.000	-.112	-.064	-.418(**)	.029	.152	.084	-.018	-.094	.060	-.080	-.261(*)	.025	-.086	.019	-.209	.304(**)	.045
	Sig. (2-tailed)	.634	.	.315	.590	.000	.806	.180	.462	.873	.440	.618	.497	.030	.843	.459	.879	.097	.005	.706
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Ed	Correlation Coefficient	.083	-.112	1.000	.116	-.001	.372(**)	.111	.171	-.076	-.169	-.296(*)	-.108	.151	-.095	-.048	.185	.140	-.233(*)	-.062
	Sig. (2-tailed)	.481	.315	.	.328	.991	.002	.331	.134	.493	.162	.014	.364	.209	.442	.684	.140	.269	.033	.595
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Housesize	Correlation Coefficient	-.175	-.064	.116	1.000	.354(**)	.178	.018	.237	-.040	-.036	-.032	.000	-.109	.039	-.144	-.047	-.211	-.151	.126
	Sig. (2-tailed)	.168	.590	.328	.	.005	.153	.881	.051	.736	.778	.805	1.000	.394	.766	.241	.723	.116	.186	.316
	N	62	62	62	62	62	53	55	55	56	60	61	54	56	57	54	57	55	53	61
Children	Correlation Coefficient	.142	-.418(**)	-.001	.354(**)	1.000	.113	-.067	.161	.180	.066	-.091	-.083	.059	-.041	-.010	-.108	.014	-.232(*)	-.013
	Sig. (2-tailed)	.257	.000	.991	.005	.	.362	.573	.176	.123	.604	.471	.503	.640	.750	.937	.411	.913	.040	.918
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Income	Correlation Coefficient	-.301(*)	.029	.372(**)	.178	.113	1.000	.107	.302(*)	.112	.193	-.089	.049	-.117	.105	.018	-.055	.263(*)	-.189	-.083

	ent																			
	Sig. (2-tailed)	.017	.806	.002	.153	.362	.	.377	.012	.341	.129	.485	.685	.355	.427	.883	.675	.047	.098	.507
	N	53	53	53	53	53	53	47	47	48	52	52	47	48	48	45	48	48	45	52
Soil	Correlation Coefficient	-.007	.152	.111	.018	-.067	.107	1.000	.530(**)	.400(**)	-.023	.173	.189	-.141	.150	.242(*)	.251(*)	-.102	-.002	-.032
	Sig. (2-tailed)	.953	.180	.331	.881	.573	.377	.	.000	.000	.852	.154	.101	.235	.222	.035	.042	.405	.986	.788
	N	56	56	56	55	56	47	56	56	56	56	56	52	54	55	51	54	55	50	55
Water	Correlation Coefficient	.097	.084	.171	.237	.161	.302(*)	.530(**)	1.000	.350(**)	-.029	.105	.013	-.085	.258(*)	.152	.167	-.092	-.112	-.091
	Sig. (2-tailed)	.425	.462	.134	.051	.176	.012	.000	.	.001	.809	.388	.912	.473	.036	.191	.176	.452	.294	.452
	N	56	56	56	55	56	47	56	56	56	56	56	52	54	55	51	54	55	50	55
Air	Correlation Coefficient	.038	-.018	-.076	-.040	.180	.112	.400(**)	.350(**)	1.000	.176	.146	.199	.002	.164	.220	.185	.044	-.088	.172
	Sig. (2-tailed)	.751	.873	.493	.736	.123	.341	.000	.001	.	.138	.219	.078	.987	.171	.051	.127	.715	.401	.146
	N	57	57	57	56	57	48	56	56	57	57	57	53	55	56	52	55	56	51	56
Contact	Correlation Coefficient	-.233	-.094	-.169	-.036	.066	.193	-.023	-.029	.176	1.000	.387(**)	.352(**)	.000	.195	.185	-.072	.380(**)	.100	.139
	Sig. (2-tailed)	.071	.440	.162	.778	.604	.129	.852	.809	.138	.	.003	.005	1.000	.148	.143	.595	.005	.396	.281
	N	61	61	61	60	61	52	56	56	57	61	60	54	55	56	52	55	56	51	60
Plan	Correlation Coefficient	.077	.060	-.296(*)	-.032	-.091	-.089	.173	.105	.146	.387(**)	1.000	.356(**)	-.115	.308(*)	.348(**)	.122	-.054	.217	.181
	Sig. (2-tailed)	.549	.618	.014	.805	.471	.485	.154	.388	.219	.003	.	.005	.367	.020	.005	.362	.690	.059	.154
	N	62	62	62	61	62	52	56	56	57	60	62	53	57	58	54	57	56	53	61
Informed	Correlation Coefficient	-.242	-.080	-.108	.000	-.083	.049	.189	.013	.199	.352(**)	.356(**)	1.000	-.001	.333(**)	.428(**)	.049	-.038	.180	.210
	Sig. (2-tailed)	.054	.497	.364	1.000	.503	.685	.101	.912	.078	.005	.005	.	.993	.009	.000	.704	.765	.101	.095
	N	54	54	54	54	54	47	52	52	53	54	53	54	52	52	50	52	52	49	53

FiveYears	Correlation Coefficient	.068	-.261(*)	.151	-.109	.059	-.117	-.141	-.085	.002	.000	-.115	-.001	1.000	.049	.126	.365(**)	.117	.042	.260(*)
	Sig. (2-tailed)	.597	.030	.209	.394	.640	.355	.235	.473	.987	1.000	.367	.993	.	.703	.297	.005	.372	.708	.040
	N	57	57	57	56	57	48	54	54	55	55	57	52	57	56	52	55	54	52	56
DailyAir	Correlation Coefficient	-.013	.025	-.095	.039	-.041	.105	.150	.258(*)	.164	.195	.308(*)	.333(**)	.049	1.000	.494(**)	.296(*)	.132	.152	.110
	Sig. (2-tailed)	.924	.843	.442	.766	.750	.427	.222	.036	.171	.148	.020	.009	.703	.	.000	.028	.334	.191	.400
	N	58	58	58	57	58	48	55	55	56	56	58	52	56	58	54	56	55	52	57
CheckAir	Correlation Coefficient	.011	-.086	-.048	-.144	-.010	.018	.242(*)	.152	.220	.185	.348(**)	.428(**)	.126	.494(**)	1.000	.401(**)	.035	.041	.195
	Sig. (2-tailed)	.929	.459	.684	.241	.937	.883	.035	.191	.051	.143	.005	.000	.297	.000	.	.001	.781	.698	.107
	N	54	54	54	54	54	45	51	51	52	52	54	50	52	54	54	53	51	50	54
AirPlan	Correlation Coefficient	.142	.019	.185	-.047	-.108	-.055	.251(*)	.167	.185	-.072	.122	.049	.365(**)	.296(*)	.401(**)	1.000	.110	.115	.273(*)
	Sig. (2-tailed)	.288	.879	.140	.723	.411	.675	.042	.176	.127	.595	.362	.704	.005	.028	.001	.	.425	.323	.039
	N	57	57	57	57	57	48	54	54	55	55	57	52	55	56	53	57	54	52	56
LocalGrp	Correlation Coefficient	-.128	-.209	.140	-.211	.014	.263(*)	-.102	-.092	.044	.380(**)	-.054	-.038	.117	.132	.035	.110	1.000	.034	-.142
	Sig. (2-tailed)	.343	.097	.269	.116	.913	.047	.405	.452	.715	.005	.690	.765	.372	.334	.781	.425	.	.777	.290
	N	56	56	56	55	56	48	55	55	56	56	56	52	54	55	51	54	56	50	55
YRSatZip	Correlation Coefficient	-.008	.304(**)	-.233(*)	-.151	-.232(*)	-.189	-.002	-.112	-.088	.100	.217	.180	.042	.152	.041	.115	.034	1.000	.182
	Sig. (2-tailed)	.943	.005	.033	.186	.040	.098	.986	.294	.401	.396	.059	.101	.708	.191	.698	.323	.777	.	.106
	N	53	53	53	53	53	45	50	50	51	51	53	49	52	52	50	52	50	53	53
TotalTRI	Correlation Coefficient	.109	.045	-.062	.126	-.013	-.083	-.032	-.091	.172	.139	.181	.210	.260(*)	.110	.195	.273(*)	-.142	.182	1.000
	Sig. (2-	.386	.706	.595	.316	.918	.507	.788	.452	.146	.281	.154	.095	.040	.400	.107	.039	.290	.106	.

	tailed)																			
	N	62	62	62	61	62	52	55	55	56	60	61	53	56	57	54	56	55	53	62
Gender	Correlation Coefficient	1.000	-.060	.089	-.176	.144	-.332(*)	-.008	.107	.042	-.233	.077	-.265	.071	-.013	.012	.142	-.128	-.010	.111
	Sig. (2-tailed)	.	.638	.486	.170	.261	.015	.954	.430	.754	.071	.554	.053	.602	.925	.930	.293	.347	.944	.390
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Age	Correlation Coefficient	-.060	1.000	-.139	-.063	-.452(**)	.031	.178	.096	-.019	-.100	.064	-.094	-.286(*)	.026	-.109	.020	-.224	.382(**)	.048
	Sig. (2-tailed)	.638	.	.276	.629	.000	.823	.190	.480	.890	.444	.622	.499	.031	.845	.431	.881	.098	.005	.713
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Ed	Correlation Coefficient	.089	-.139	1.000	.127	-.002	.434(**)	.130	.195	-.086	-.181	-.316(*)	-.118	.167	-.102	-.051	.197	.149	-.299(*)	-.068
	Sig. (2-tailed)	.486	.276	.	.327	.987	.001	.339	.149	.523	.164	.012	.395	.216	.447	.715	.142	.273	.030	.599
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Housesize	Correlation Coefficient	-.176	-.063	.127	1.000	.370(**)	.203	.021	.267(*)	-.045	-.037	-.032	.002	-.115	.040	-.162	-.047	-.214	-.181	.130
	Sig. (2-tailed)	.170	.629	.327	.	.003	.145	.879	.049	.741	.781	.808	.990	.400	.769	.242	.727	.117	.194	.319
	N	62	62	62	62	62	53	55	55	56	60	61	54	56	57	54	57	55	53	61
Children	Correlation Coefficient	.144	-.452(**)	-.002	.370(**)	1.000	.130	-.076	.179	.207	.067	-.092	-.088	.063	-.042	-.010	-.110	.015	-.289(*)	-.014
	Sig. (2-tailed)	.261	.000	.987	.003	.	.352	.577	.186	.121	.609	.476	.527	.641	.754	.941	.416	.914	.036	.915
	N	63	63	63	62	63	53	56	56	57	61	62	54	57	58	54	57	56	53	62
Income	Correlation Coefficient	-.332(*)	.031	.434(**)	.203	.130	1.000	.132	.357(*)	.139	.213	-.098	.070	-.138	.116	.023	-.061	.290(*)	-.234	-.091
	Sig. (2-tailed)	.015	.823	.001	.145	.352	.	.375	.014	.347	.130	.491	.642	.351	.433	.882	.680	.046	.121	.521
	N	53	53	53	53	53	53	47	47	48	52	52	47	48	48	45	48	48	45	52
Soil	Correlation Coefficient	-.008	.178	.130	.021	-.076	.132	1.000	.573(**)	.447(**)	-.025	.192	.224	-.168	.166	.297(*)	.279(*)	-.113	-.001	-.031

	ent																			
	Sig. (2-tailed)	.954	.190	.339	.879	.577	.375	.	.000	.001	.854	.155	.110	.226	.225	.034	.041	.410	.995	.823
	N	56	56	56	55	56	47	56	56	56	56	56	52	54	55	51	54	55	50	55
Water	Correlation Coefficient	.107	.096	.195	.267(*)	.179	.357(*)	.573(**)	1.000	.408(**)	-.033	.116	.012	-.102	.286(*)	.184	.186	-.102	-.149	-.098
	Sig. (2-tailed)	.430	.480	.149	.049	.186	.014	.000	.	.002	.812	.393	.933	.465	.034	.197	.179	.457	.303	.478
	N	56	56	56	55	56	47	56	56	56	56	56	52	54	55	51	54	55	50	55
Air	Correlation Coefficient	.042	-.019	-.086	-.045	.207	.139	.447(**)	.408(**)	1.000	.198	.164	.245	.000	.184	.275(*)	.208	.049	-.112	.197
	Sig. (2-tailed)	.754	.890	.523	.741	.121	.347	.001	.002	.	.139	.223	.077	.998	.173	.048	.128	.719	.434	.145
	N	57	57	57	56	57	48	56	56	57	57	57	53	55	56	52	55	56	51	56
Contact	Correlation Coefficient	-.233	-.100	-.181	-.037	.067	.213	-.025	-.033	.198	1.000	.387(**)	.385(**)	.000	.195	.205	-.072	.380(**)	.120	.140
	Sig. (2-tailed)	.071	.444	.164	.781	.609	.130	.854	.812	.139	.	.002	.004	1.000	.150	.145	.600	.004	.401	.285
	N	61	61	61	60	61	52	56	56	57	61	60	54	55	56	52	55	56	51	60
Plan	Correlation Coefficient	.077	.064	-.316(*)	-.032	-.092	-.098	.192	.116	.164	.387(**)	1.000	.390(**)	-.120	.308(*)	.386(**)	.122	-.054	.262	.184
	Sig. (2-tailed)	.554	.622	.012	.808	.476	.491	.155	.393	.223	.002	.	.004	.372	.019	.004	.367	.694	.058	.155
	N	62	62	62	61	62	52	56	56	57	60	62	53	57	58	54	57	56	53	61
Informed	Correlation Coefficient	-.265	-.094	-.118	.002	-.088	.070	.224	.012	.245	.385(**)	.390(**)	1.000	.009	.365(**)	.527(**)	.053	-.042	.240	.235
	Sig. (2-tailed)	.053	.499	.395	.990	.527	.642	.110	.933	.077	.004	.004	.	.948	.008	.000	.708	.769	.096	.090
	N	54	54	54	54	54	47	52	52	53	54	53	54	52	52	50	52	52	49	53
FiveYears	Correlation Coefficient	.071	-.286(*)	.167	-.115	.063	-.138	-.168	-.102	.000	.000	-.120	.009	1.000	.051	.143	.382(**)	.123	.059	.276(*)
	Sig. (2-tailed)	.602	.031	.216	.400	.641	.351	.226	.465	.998	1.000	.372	.948	.	.707	.311	.004	.377	.676	.040
	N	57	57	57	56	57	48	54	54	55	55	57	52	57	56	52	55	54	52	56

DailyAir	Correlation Coefficient	-.013	.026	-.102	.040	-.042	.116	.166	.286(*)	.184	.195	.308(*)	.365(**)	.051	1.000	.549(**)	.296(*)	.132	.183	.112
	Sig. (2-tailed)	.925	.845	.447	.769	.754	.433	.225	.034	.173	.150	.019	.008	.707	.	.000	.027	.338	.194	.405
	N	58	58	58	57	58	48	55	55	56	56	58	52	56	58	54	56	55	52	57
Check Air	Correlation Coefficient	.012	-.109	-.051	-.162	-.010	.023	.297(*)	.184	.275(*)	.205	.386(**)	.527(**)	.143	.549(**)	1.000	.446(**)	.039	.060	.211
	Sig. (2-tailed)	.930	.431	.715	.242	.941	.882	.034	.197	.048	.145	.004	.000	.311	.000	.	.001	.785	.680	.125
	N	54	54	54	54	54	45	51	51	52	52	54	50	52	54	54	53	51	50	54
AirPlan	Correlation Coefficient	.142	.020	.197	-.047	-.110	-.061	.279(*)	.186	.208	-.072	.122	.053	.382(**)	.296(*)	.446(**)	1.000	.110	.138	.279(*)
	Sig. (2-tailed)	.293	.881	.142	.727	.416	.680	.041	.179	.128	.600	.367	.708	.004	.027	.001	.	.430	.328	.037
	N	57	57	57	57	57	48	54	54	55	55	57	52	55	56	53	57	54	52	56
LocalGrp	Correlation Coefficient	-.128	-.224	.149	-.214	.015	.290(*)	-.113	-.102	.049	.380(**)	-.054	-.042	.123	.132	.039	.110	1.000	.041	-.144
	Sig. (2-tailed)	.347	.098	.273	.117	.914	.046	.410	.457	.719	.004	.694	.769	.377	.338	.785	.430	.	.780	.294
	N	56	56	56	55	56	48	55	55	56	56	56	52	54	55	51	54	56	50	55
YRSatZip	Correlation Coefficient	-.010	.382(**)	-.299(*)	-.181	-.289(*)	-.234	-.001	-.149	-.112	.120	.262	.240	.059	.183	.060	.138	.041	1.000	.225
	Sig. (2-tailed)	.944	.005	.030	.194	.036	.121	.995	.303	.434	.401	.058	.096	.676	.194	.680	.328	.780	.	.106
	N	53	53	53	53	53	45	50	50	51	51	53	49	52	52	50	52	50	53	53
TotalTRI	Correlation Coefficient	.111	.048	-.068	.130	-.014	-.091	-.031	-.098	.197	.140	.184	.235	.276(*)	.112	.211	.279(*)	-.144	.225	1.000
	Sig. (2-tailed)	.390	.713	.599	.319	.915	.521	.823	.478	.145	.285	.155	.090	.040	.405	.125	.037	.294	.106	.
	N	62	62	62	61	62	52	55	55	56	60	61	53	56	57	54	56	55	53	62

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

APPENDIX C: CROSSTAB ASSOCIATIONS BETWEEN PLAN AND NOMINAL VARIABLES

Associations between "Emergency Plan Adoption" and the other "yes/no" variables:

```
CROSSTABS
  /TABLES=Plan  BY Gender FiveYears DailyAir AirPlan LocalGrp
  /FORMAT= AVALUE TABLES
  /STATISTIC=PHI
  /CELLS= COUNT EXPECTED
  /COUNT ROUND CELL .
```

Crosstabs

[DataSet1] C:\Program Files\SPSS\Corrinthia's Community Survey Data Pt. 2.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Plan * Gender	62	98.4%	1	1.6%	63	100.0%
Plan * FiveYears	57	90.5%	6	9.5%	63	100.0%
Plan * DailyAir	58	92.1%	5	7.9%	63	100.0%
Plan * AirPlan	57	90.5%	6	9.5%	63	100.0%
Plan * LocalGrp	56	88.9%	7	11.1%	63	100.0%

Plan * Gender

Crosstab

			Gender		Total
			1	2	
Plan	0	Count	23	24	47
		Expected Count	22.0	25.0	47.0
	1	Count	6	9	15
		Expected Count	7.0	8.0	15.0
Total		Count	29	33	62
		Expected Count	29.0	33.0	62.0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.077	.546
	Cramer's V	.077	.546
N of Valid Cases		62	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * FiveYears

Crosstab

			FiveYears			Total
			0	1	2	
Plan	0	Count	22	4	18	44
		Expected Count	22.4	6.2	15.4	44.0
	1	Count	7	4	2	13
		Expected Count	6.6	1.8	4.6	13.0
Total		Count	29	8	20	57
		Expected Count	29.0	8.0	20.0	57.0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.304	.072
	Cramer's V	.304	.072
N of Valid Cases		57	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * DailyAir

Crosstab

			Daily Air		Total
			0	1	
Plan	0	Count	18	26	44
		Expected Count	14.4	29.6	44.0
	1	Count	1	13	14
		Expected Count	4.6	9.4	14.0
Total		Count	19	39	58
		Expected Count	19.0	39.0	58.0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.308	.019
	Cramer's V	.308	.019
N of Valid Cases		58	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * AirPlan

Crosstab

			AirPlan		Total
			0	1	
Plan	0	Count	28	14	42
		Expected Count	26.5	15.5	42.0
	1	Count	8	7	15
		Expected Count	9.5	5.5	15.0
Total		Count	36	21	57
		Expected Count	36.0	21.0	57.0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.122	.358
	Cramer's V	.122	.358
N of Valid Cases		57	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * LocalGrp

Crosstab

			LocalGrp		
			0	1	Total
Plan	0	Count	38	5	43
		Expected Count	38.4	4.6	43.0
	1	Count	12	1	13
		Expected Count	11.6	1.4	13.0
Total		Count	50	6	56
		Expected Count	50.0	6.0	56.0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.054	.688
	Cramer's V	.054	.688
N of Valid Cases		56	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

APPENDIX D: CROSSTAB ASSOCIATIONS BETWEEN PLAN AND ORDIANAL VARIABLES

```
CROSSTABS
  /TABLES=Plan  BY Age Ed Children Housesize Income Soil Water Air Informed
  CheckAir
  /FORMAT= AVALUE TABLES
  /STATISTIC=BTAU
  /CELLS= COUNT EXPECTED
  /COUNT ROUND CELL .
```

Crosstabs

[DataSet1] C:\Program Files\SPSS\Corrinthia's Community Survey Data Pt. 2.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Plan * Age	62	98.4%	1	1.6%	63	100.0%
Plan * Ed	62	98.4%	1	1.6%	63	100.0%
Plan * Children	62	98.4%	1	1.6%	63	100.0%
Plan * Housesize	61	96.8%	2	3.2%	63	100.0%
Plan * Income	52	82.5%	11	17.5%	63	100.0%
Plan * Soil	56	88.9%	7	11.1%	63	100.0%
Plan * Water	56	88.9%	7	11.1%	63	100.0%
Plan * Air	57	90.5%	6	9.5%	63	100.0%
Plan * Informed	53	84.1%	10	15.9%	63	100.0%
Plan * CheckAir	54	85.7%	9	14.3%	63	100.0%

Plan * Age

Crosstab

			Age					Total
			1	2	3	4	5	
Plan	0	Count	6	1	2	10	28	47
		Expected Count	4.5	2.3	2.3	9.1	28.8	47.0
	1	Count	0	2	1	2	10	15
		Expected Count	1.5	.7	.7	2.9	9.2	15.0
Total		Count	6	3	3	12	38	62
		Expected Count	6.0	3.0	3.0	12.0	38.0	62.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.060	.115	.521	.602
N of Valid Cases		62			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Ed

Crosstab

			Ed					Total
			0	1	2	3	4	
Plan	0	Count	1	0	7	18	21	47
		Expected Count	.8	1.5	8.3	19.0	17.4	47.0
	1	Count	0	2	4	7	2	15
		Expected Count	.2	.5	2.7	6.0	5.6	15.0
Total		Count	1	2	11	25	23	62
		Expected Count	1.0	2.0	11.0	25.0	23.0	62.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	-.296	.106	-2.601	.009
N of Valid Cases		62			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Children

Crosstab

			Children				Total
			0	1	2	3	
Plan	0	Count	40	5	2	0	47
		Expected Count	40.9	3.8	1.5	.8	47.0
	1	Count	14	0	0	1	15
		Expected Count	13.1	1.2	.5	.2	15.0
Total		Count	54	5	2	1	62
		Expected Count	54.0	5.0	2.0	1.0	62.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	-.091	.110	-.811	.417
N of Valid Cases		62			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Housesize

Crosstab

			Housesize			Total
			0	1	2	
Plan	0	Count	1	43	2	46
		Expected Count	1.5	42.2	2.3	46.0
	1	Count	1	13	1	15
		Expected Count	.5	13.8	.7	15.0
Total		Count	2	56	3	61
		Expected Count	2.0	56.0	3.0	61.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	-.032	.151	-.208	.836
N of Valid Cases		61			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Income

Crosstab

			Income					Total
			1	2	3	4	5	
Plan	0	Count	2	10	8	5	15	40
		Expected Count	3.1	8.5	10.0	4.6	13.8	40.0
	1	Count	2	1	5	1	3	12
		Expected Count	.9	2.5	3.0	1.4	4.2	12.0
Total		Count	4	11	13	6	18	52
		Expected Count	4.0	11.0	13.0	6.0	18.0	52.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	-.089	.123	-.715	.475
N of Valid Cases		52			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Soil

Crosstab

			Soil						Total
			0	1	2	3	4	5	
Plan	0	Count	14	3	2	12	9	3	43
		Expected Count	12.3	3.8	1.5	11.5	9.2	4.6	43.0
	1	Count	2	2	0	3	3	3	13
		Expected Count	3.7	1.2	.5	3.5	2.8	1.4	13.0
Total		Count	16	5	2	15	12	6	56
		Expected Count	16.0	5.0	2.0	15.0	12.0	6.0	56.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.173	.119	1.417	.157
N of Valid Cases		56			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Water

Crosstab

			Water						Total
			0	1	2	3	4	5	
Plan	0	Count	6	2	5	5	11	14	43
		Expected Count	5.4	2.3	4.6	4.6	10.8	15.4	43.0
	1	Count	1	1	1	1	3	6	13
		Expected Count	1.6	.7	1.4	1.4	3.3	4.6	13.0
Total		Count	7	3	6	6	14	20	56
		Expected Count	7.0	3.0	6.0	6.0	14.0	20.0	56.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.105	.119	.873	.382
N of Valid Cases		56			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Air

Crosstab

			Air						Total
			0	1	2	3	4	5	
Plan	0	Count	8	2	5	13	9	6	43
		Expected Count	6.8	3.0	5.3	10.6	9.1	8.3	43.0
	1	Count	1	2	2	1	3	5	14
		Expected Count	2.2	1.0	1.7	3.4	2.9	2.7	14.0
Total		Count	9	4	7	14	12	11	57
		Expected Count	9.0	4.0	7.0	14.0	12.0	11.0	57.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.146	.124	1.159	.246
N of Valid Cases		57			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * Informed

Crosstab

			Informed					Total
			1	2	3	4	5	
Plan	0	Count	18	11	8	2	2	41
		Expected Count	14.7	10.1	10.1	4.6	1.5	41.0
	1	Count	1	2	5	4	0	12
		Expected Count	4.3	2.9	2.9	1.4	.5	12.0
Total		Count	19	13	13	6	2	53
		Expected Count	19.0	13.0	13.0	6.0	2.0	53.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.356	.105	3.022	.003
N of Valid Cases		53			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Plan * CheckAir

Crosstab

			CheckAir						Total
			0	1	2	3	4	5	
Plan	0	Count	0	16	7	10	5	2	40
		Expected Count	.7	11.9	5.9	11.1	6.7	3.7	40.0
	1	Count	1	0	1	5	4	3	14
		Expected Count	.3	4.1	2.1	3.9	2.3	1.3	14.0
Total		Count	1	16	8	15	9	5	54
		Expected Count	1.0	16.0	8.0	15.0	9.0	5.0	54.0

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.348	.112	2.904	.004
N of Valid Cases		54			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

APPENDIX E: CROSSTAB ASSOCIATIONS BETWEEN PLAN AND INTERVAL VARIABLES

```
CROSSTABS
  /TABLES=YRSatZip TotalTRI  BY Plan
  /FORMAT= AVALUE TABLES
  /STATISTIC=CHISQ CORR
  /CELLS= COUNT EXPECTED
  /COUNT ROUND CELL .
```

Crosstabs

[DataSet1] C:\Program Files\SPSS\Corrinthia's Community Survey Data Pt. 2.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
YRSatZip * Plan	53	84.1%	10	15.9%	63	100.0%
TotalTRI * Plan	61	96.8%	2	3.2%	63	100.0%

YRSatZip * Plan

Crosstab

			Plan		Total
			0	1	
YRSatZip	1	Count	3	0	3
		Expected Count	2.2	.8	3.0
	2	Count	3	0	3
		Expected Count	2.2	.8	3.0
	3	Count	2	0	2
		Expected Count	1.5	.5	2.0
	5	Count	1	0	1
		Expected Count	.7	.3	1.0
	7	Count	2	0	2
		Expected Count	1.5	.5	2.0
	8	Count	1	0	1
		Expected Count	.7	.3	1.0
	9	Count	1	1	2
		Expected Count	1.5	.5	2.0
	10	Count	3	0	3
		Expected Count	2.2	.8	3.0
	11	Count	2	0	2
		Expected Count	1.5	.5	2.0
	13	Count	0	1	1
		Expected Count	.7	.3	1.0
	15	Count	1	2	3
		Expected Count	2.2	.8	3.0
	16	Count	1	0	1
		Expected Count	.7	.3	1.0
	17	Count	1	0	1
		Expected Count	.7	.3	1.0
	20	Count	1	0	1
		Expected Count	.7	.3	1.0
	23	Count	1	0	1
		Expected Count	.7	.3	1.0
	25	Count	1	0	1
		Expected Count	.7	.3	1.0
	26	Count	1	0	1
		Expected Count	.7	.3	1.0
	27	Count	0	1	1
		Expected Count	.7	.3	1.0
	30	Count	0	1	1
		Expected Count	.7	.3	1.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	41.853[a]	36	.232
Likelihood Ratio	49.063	36	.072
Linear-by-Linear Association	2.545	1	.111
N of Valid Cases	53		

a. 74 cells (100.0%) have expected count less than 5. The minimum expected count is .26.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.221	.124	1.620	.111[c]
Ordinal by Ordinal	Spearman Correlation	.262	.114	1.937	.058[c]
N of Valid Cases		53			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

TotalTRI * Plan

Crosstab

			Plan		Total
			0	1	
TotalTRI	.00	Count	41	11	52
		Expected Count	39.2	12.8	52.0
	983588.00	Count	3	3	6
		Expected Count	4.5	1.5	6.0
	1000898.00	Count	1	1	2
		Expected Count	1.5	.5	2.0
	10050313.00	Count	1	0	1
		Expected Count	.8	.2	1.0
Total		Count	46	15	61
		Expected Count	46.0	15.0	61.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.443[a]	3	.328
Likelihood Ratio	3.297	3	.348
Linear-by-Linear Association	.011	1	.917
N of Valid Cases	61		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .25.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.014	.076	-.104	.918[c]
Ordinal by Ordinal	Spearman Correlation	.184	.144	1.440	.155[c]
N of Valid Cases		61			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

APPENDIX F: COMMUNITY INTERVIEW RESPONSES

Interview ID	Gender	Age	Ed	House Size	Children	Income	Soil	Water	Air	Contact	Plan	Informed	5 yrs.	Daily Air	Check Air	Air Plan	Local Grp.	Zip	Yr. at Zip	TRI Facility
1	2	4	4	1	1	5	3	3	5	0	0	2	2	1	5	1	0	70806	15	0
2	2	3	3	1	0	3	0	0	0	1	1	2	2	1	3	1	0	70791	47	1
3	1	5	2	1	0	-	-	-	-	-	1	-	0	1	3	0	-	70714	40	0
4	1	5	3	1	0	-	1	1	1	1	0	4	2	1	2	0	0	70791	60	1
5	2	5	2	1	0	2	0	0	3	0	0	-	0	0	-	0	0	70791	78	1
6	2	5	3	1	0	-	3	3	4	0	0	3	2	1	3	1	0	70791	64	1
7	2	5	4	1	0	3	4	4	0	0	0	1	0	0	1	1	0	70814	17	1
8	1	2	3	2	3	4	0	5	5	1	1	3	1	0	2	0	0	70791	9	1
9	1	5	2	1	0	4	2	2	2	1	0	2	0	0	3	0	0	70714		1
10	2	1	3	1	0	2	1	3	2	0	0	1	2	0	1	0	0	70808	7	0
11	1	1	3	1	0	1	0	0	5	0	0	2	2	1	4	1	0	70809	1	0
12	1	4	3	1	0	5	1	2	2	1	1	3	1	1	4	1	1	70777	31	0
13	2	1	3	0	1	3	1	2	5	1	0	2	2	0	-	0	1	70808	5	0
14	1	5	3	1	0	3	3	3	5	1	1	3	2	1	3	1	0	70791	44	1
15	2	4	4	1	0	3	5	5	5	0	0	2	2	1	4	1	0	70807	2	1
16	2	5	4	1	0	5	5	5	5	0	1	-	0	1	4	1	0	70807	15	1
17	1	5	2	1	0	2	0	0	0	0	0	3	0	1	-	0	0	-	-	

18	1	5	1	1	0	-	5	5	5	0	1	-	-	1	3	1	0	708 11	-	0
19	5	2	2	0	0	3	3	4	4	1	1	4	0	1	4	0	0	708 11	36	0
20	2	5	2	1	0	2	-	-	-	-	0	-	2	1	4	1	-	708 05	40	1
21	2	5	1	1	0	1	-	-	1	0	4	2	1	3	0	0	0	708 02	79	0
22	2	5	1	1	0	1	-	-	-	0	-	1	-	-	-	-	-	-	-	
23	1	4	0	-	0	-	0	0	0	0	0	-	0	0	-	-	0	-	-	
24	2	5	2	1	1	1	5	5	5	0	0	1	1	0	2	1	0	708 11	64	0
25	1	5	3	1	0	5	5	5	5	1	1	3	0	1	5	0	0	708 11	27	0
26	1	5	3	1	0	5	3	5	4	0	0	2	2	1	1	1	0	708 06	40	0
27	1	5	4	1	0	5	3	5	2	0	0	2	2	1	5	1	0	708 06	41	0
28	2	5	4	1	0	5	0	0	0	0	0	1	2	0	1	0	0	708 06	3	0
29	2	5	4	1	0	.	3	5	2	1	1	3	0	1	4	1	.	708 06	13	0
30	1	4	4	1	0	4	3	4	1	1	0	1	2	1	4	1	1	708 06	11	0
31	2	5	4	1	0	.	4	5	4	0	0	2	1	0	1	0	0	708 06	9	0
32	1	5	4	1	0	4	0	4	3	0	0	1	0	0	1	0	0	708 06	10	0
33	1	5	3	1	0	2	3	2	3	0	0	3	0	1	2	0	0	708 06	53	0
34	2	4	4	1	0	5	3	5	4	0	0	1	0	1	2	1	1	708 06	33	0
35	1	1	4	1	0	4	0	2	0	0	0	3	2	0	1	0	0	708 06	20	0
36	1	4	4	1	0	5	3	4	3	1	0	2	2	1	2	0	1	708 06	55	0
37	2	4	4	1	0	3	3	3	3	0	0	1	0	0	1	0	0	708	25	0

																		06		
38	1	3	3	2	2	5	4	5	4	1	0	5	0	1	3	0	0	70806	1	0
39	1	5	3	1	0	5	4	5	3	0	0	2	0	1	3	0	0	70806	7	0
40	2	3	3	1	1	.	0	4	3	0	0	1	2	1	3	0	0	70806	16	0
41	1	5	3	1	0	5	0	1	4	1	0	3	0	1	1	0	1	70806	26	0
42	2	5	3	1	0	3	4	4	3	0	1	4	0	1	5	0	0	70806	40	0
43	2	5	2	1	0	1	1	1	1	0	1	1	0	.	.	0	0	70806	15	0
44	2	5	4	1	0	2	2	2	2	0	0	1	2	0	1	1	0	70806	10	0
45	2	4	3	1	0	2	4	4	4	1	1	4	1	1	3	0	0	70806	58	0
46	1	5	3	1	0	5	.	.	.	0	0	.	.	.	.	.	.	.	.	
47	1	5	3	1	0	5	5	5	3	0	0	1	0	0	1	0	0	70806	34	0
48	1	5	2	1	0	.	4	4	4	1	0	1	0	1	1	0	0	70806	3	0
49	2	5	3	1	0	5	0	5	3	0	0	3	1	1	3	0	0	70806	11	0
50	2	4	3	1	0	3	.	.	.	0	0	.	.	.	.	.	.	.	.	
51	1	5	3	1	0	2	0	0	0	0	0	1	0	0	1	0	0	70806	49	0
52	1	1	3	1	0	2	4	4	3	0	0	3	2	0	3	0	0	70806	2	0
53	2	4	4	1	0	2	4	4	4	0	0	5	0	1	4	1	0	70806	23	0
54	2	2	4	2	2	5	3	5	2	0	0	1	0	1	1	0	0	70806	8	0
55	2	5	2	1	0	3	0	5	5	1	0	1	0	1	1	0	0	.	.	
56	1	5	4	1	0	5	3	3	3	1	0	3	0	0	2	0	0	70806	35	0

57	2	5	2	1	0	3	4	5	4	1	1	4	.	1	5	1	0	708 06	30	0
58	1	5	4	1	0	4	4	4	3	0	0	2	0	1	3	0	0	708 06	10	0
59	1	4	4	1	0	3	4	5	3	0	0	4	1	1	3	1	0	708 06	.	0
60	2	1	3	1	1	.	0	4	0	0	0	1	0	1	2	0	0	708 06	1	0
61	2	5	4	1	0	2	0	5	0	0	0	1	2	1	3	.	0	708 06	43	0
62	2	5	4	1	0	5	3	4	4	0	0	1	0	0	1	0	0	708 06	2	0
63	2	5	4	1	0	3	.	.	.	0	0	.	.	.	.	.	.	.	.	

VITA

Corrinthia Marie Hinton was born in Hattiesburg, Mississippi, in 1987 to Willie and Donna Hinton. She spent her early years in Hattiesburg and her family later moved to Gulfport, Mississippi. She attended Harrison Central 9th Grade and Harrison Central High School where she was a played the flute in the band, was a cheerleader and later an athletic trainer. She also participated in numerous clubs and activities such as the Harrison Central Junior Leadership Program, Beta Club, Key Club, National Honor Society, Envirothon, Environmental Club, and the Vocational Industrial Clubs of America where she was a quiz bowl team member and Parliamentarian. She graduated High School with High Honors in a class of approximately 500 students which earned her full scholarship opportunities to numerous universities. Following her graduation from high school in 2005, she attended the University of Arkansas at Pine Bluff. While at UAPB she majored in regulatory sciences with an emphasis in environmental biology. She participated in clubs such as the Regulatory Sciences Club, Minorities in Natural Resource Conservation, and MANNRS. She was also a UAPB Baseball Diamond Doll and in the UAPB Honors College. In March of 2007 she was blessed with a beautiful baby boy whom she named Nehemiah J. Hinton. She successfully completed her matriculation at U of A Pine Bluff and graduated *Magna Cum Laude* with a bachelor of sciences degree in Regulatory Sciences. She decided to continue her studies at Louisiana State University. She will graduate in May 2012 with a master's in environmental sciences with a concentration of studies in planning and management.