

Article

Lived experiences of reducing environmental risks in an environmental justice community

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Abstract

Environmental risks cause physical and psychological distresses to individuals who live in environmental justice (EJ) communities and significantly affect their perception of wellbeing. Little is known about how these individuals perceive and manage to reduce environmental risks. The study utilizes a phenomenological approach to explore and describe these individuals' perceived environmental risk and their experience of reducing such risks. A qualitative and longitudinal design with a descriptive phenomenological method was used to recruit 23 participants living in a known EJ community in the Ironbound, New Jersey. A total of 43 in-depth interviews were completed, audio recorded, and transcribed. Interview transcripts and field notes were the data sources. Data was analyzed to identify the essential structure of their experience. Participants described their awareness and perception of environmental risks in their community and the strategies they purposively assumed to protect themselves. Three essential intentional risk reduction strategies undertaken by the participants were: reducing personal exposure to environmental hazards, trying to work with the community to improve environmental conditions, and taking individual action to improve the community. The environmental risks perceived by participants tended to be small and insignificant in scale and local in space, but directly affect their wellbeing. To enhance individuals' intentional risk reduction strategies and optimize the living experiences in EJ communities, future research and policy making should focus on comprehensive strategies that incorporate individuals' perceptions and intentional strategies to develop community specific environmental policy and action plans.

Keywords Lived experiences; environmental justice; qualitative research; descriptive phenomenology; ironbound; Newark.

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1 Introduction

An environmental justice (EJ) community generally refers to a low-income and minority community with EJ concerns. An EJ concern is the actual or potential lack of fair treatment or meaningful involvement of minority, low-income, or indigenous populations, or tribes in the development, implementation, and enforcement of environmental laws, regulations, and policies (EPA, 2010). Despite significant progresses in identifying and assessing environmental risks in EJ communities (Bass, 1998; Ragas, 2011), mandatory requirement for consideration of EJ concerns in environmental planning and decision making (Wilkinson 1998), and flourishing EJ grassroots movements (Veenstra et al., 2005; Wakefield et al., 2001 and 2005), environmental problems persist in EJ communities where residents are still battling environmental risks on a daily basis (Gilbert and Chakraborty, 2011; Hipp and Lakon, 2010; Mitchell and Norman, 2012).

Environmental risks cause physical and psychological distresses to individuals and significantly affect their perception of wellbeing (Cupples, 2009; Moser, 2009). Individuals' experiences encompass social and cultural factors that significantly influence their interpretation of the environmental risks (Bickerstaff, 2004; Renn, 2003). These personal interpretations of environmental risks and their influencing factors determine how effectively individuals can react and protect themselves (Cresswell, 2004). Individuals in EJ communities usually employ coping strategies to improve and maintain their wellbeing amidst the reality of a polluted community (Atari et al., 2011). Individuals' daily experiences of mitigating environmental risk should be better understood to develop effective actions and policies to improve the wellbeing of individuals in EJ communities.

Research attempted to understand individuals' experiences of living in EJ communities. Lejano and Stokols (2010) used interviews, supplemented with drawings to understand individuals' attitude and cognitive experiences towards landfill facilities in an EJ community. Later research utilized a narrative approach to better uncover these experiences (Lejano and Leong, 2012). Pluhar et al. (2009) engaged children with drawings and found children were aware of the surrounding negative environmental factors even if they cannot express them verbally. Atari et al. (2011) explores the residents' experiences of living in a community being labeled an 'area of concern' and their coping strategies to the associated environmental and health risks. Other research explored the social processes of environmental hazard, exposure and risks in EJ communities, and tried to understand residents' cognitive and emotional experiences that constitute the social fabric of communities (Northridge et al., 2003; Walker, 2010). Yet the multifaceted experience of living in an EJ community, especially how individuals reduce environmental risks in terms of perception, responses, and strategies has not been explored.

2 Methods

This study employed a descriptive phenomenological method with a qualitative and cross-sectional design (Fu and Rosedale, 2009; Porter, 1998) to ensure a deep understanding of the uniqueness of each participant's experience of living in an EJ community and the experience common to all participants when dealing with environmental risks. The study was based on the framework of Husserlian descriptive phenomenology from which certain assumptions are grounded (Husserl, 1962). Descriptive phenomenology explores individuals' experiences of everyday life, describe the structure of such experiences and provide a thorough understanding of shared experiences (Sokolowski, 2000; van Manen, 2014). The relationship between people and environment has been subject to extensive phenomenological inquiries. Examples of such inquiries include place, place attachment and place identity (Casey, 2009; Donohoe, 2014; Malpas, 2007; Mugerauer, 1994; Relph, 1976; Seamon, 2014; Stefanovic, 2000). Although phenomenology offers an important perspective to understand EJ concerns (Seamon, 2013), it is rarely applied to describe and understand individuals' lived

experiences in EJ communities with few notable examples (Atari et al., 2011; Ceaser, 2015; Lejano and Stokols, 2010).

2.1 Study setting

The Ironbound is a multi-ethnic, working class community located in the East Ward district of Newark, Essex County, New Jersey. Bound by highways, routes 1 & 9, 21, 78 and the New Jersey Turnpike, Newark Airport bounds the Ironbound to the South, and the Port of Newark and Elizabeth is on the East. The Ironbound acquired its name from the railroad tracks that once surrounded the area on three sides. The Ironbound has about 50,000 residents, and two-thirds of them are immigrants largely from Central and South America. The Environmental Protection Agency (EPA) identifies the Ironbound, Newark, New Jersey as an EJ community with disproportionately high levels of environmental hazards and a low-income immigrant population. The Ironbound has multiple pollution sources, including the municipal solid waste incinerator, the Diamond Alkali Superfund Site, daily heavy motor vehicle traffic, daily heavy airplane traffic from the Newark Liberty Airport, daily heavy sea vessel traffic from the Elizabeth Port Authority Marine Terminal and Port Newark, railroad cars, soil and water contamination around the Passaic River and Newark Bay from existing and past industrial facilities.

2.2 Sampling and sample size

The study employed a purposive sampling technique to recruit participants in the community. The inclusion criteria were: (a) being 21 years of age or older; (b) being a resident of the Ironbound for at least two years before enrolling in the study; and (c) being able to communicate in the English language.

In a phenomenological study, the adequacy of sample size is determined by the quality of the data when rich and saturated data are obtained, that is, when the participants repeated the same information while describing their experiences (Morse, 1994). Strong saturation emerged when interviewing the 21st participant. Two extra participants were enrolled and interviewed to ensure that important information is captured. Data saturation was assured when no more new information emerged in the interviews with the last two participants.

2.3 Procedures

2.3.1 Preparation

To ensure the phenomenon under study to be described as it is without bias and preconceptions, a “phenomenological reduction” (Husserl, 1962 p.103) was conducted to “bracket” (Husserl, 1962 p.98) conventional knowledge about the phenomenon prior to data collection. Through phenomenological reduction, the experience is considered for itself as it exists from a fresh start. The process of “bracketing” was achieved through formal sessions where the researchers discussed the existing literature and personal understandings of the experience (Porter, 1998). In the context of this research, the experience was that of reducing environmental risks in an EJ community. Three key areas representing conventional knowledge were bracketed: (1) risk analysis is an important mechanism for structuring environmental policy (ApSimon et al., 2002; Bowen, 2002; Brody et al., 2004); (2) Residents’ perception and response to environmental risks in EJ communities are important factors that empower grassroots movements in EJ communities (Altschuler et al., 2004; Beaumont et al., 1999; Northridge et al., 2003); and (3) EJ communities and their residents are excluded or have limited impacts on the legal and policy decisions that affect their communities (Bell et al., 2005; Holifield, 2004). Bracketing allows the research to be free of expectations and assumptions allowing the focus on the life-world from which emerged the experience of reducing environmental risks. The findings from the research were compared to the bracketed knowledge to draw new insights in reducing environmental risks in EJ communities.

2.3.2 Data collection

Interviews with 23 participants occurred between February and November 2013. Interview questions were carefully crafted to bracket out the conventional knowledge and avoid bias. Instead of asking the participants to describe specific sources of pollution sources in the community, participants were asked broader questions such as: “What is like for you to live in your community?” as well as specific questions: (1) “Please tell me what you like most about your community?” (2) “Please tell me what concerns you about your community?” and if a polluting source was mentioned the researcher asked the participant (3) “Please describe what strategies you use to reduce your exposure to environmental risks in your community.” General probes were also used to elicit more detailed information, such as “Please tell me more about that,” “How did that make you feel?” and “What else did you also do?”

Each interview lasted from 70 to 140 minutes and was recorded using a digital audio-system and observational data for each participant were also recorded. All the interviews were professionally transcribed and checked for accuracy. The interview data were integrated the observational data into final data files for analysis. Data reliability and saturation were evidenced by the emergence of similar information elicited by the participants’ answers to the same questions.

2.3.3 Data analysis

We employed a descriptive data analysis method (Porter, 1998, Fu and Rosedale, 2009) that used intuitive reflections and strategies of continuously “comparing and distinguishing, collecting and counting, presupposing and inferring.” (Husserl, 1962 p.93) Crucial to this method was a systematic classification process of text data into fewer content-related themes that share the same meaning. Efforts were made to differentiate and compare each essence of the participants’ experiences with careful selection of examples demonstrating the essences of the experience. Numerous discussions were conducted until consensus was achieved about each aspect of the process to ensure credibility of data analysis. The essences of participants’ experience of living in an EJ community were fashioned into essential themes illuminating the meanings of the experience.

3 Results

Among the 23 participants, 13 were female and 10 male. The average ages of the participants were 46.6 years old with the youngest 21 and oldest 70 years old. On average, participants lived in the community for 28.7 years with a minimum of 3 and maximum of 69 years. Eight participants had white-Caucasian cultural background, 2 Portuguese, 5 Brazilian, 7 Spanish, and 1 French. Three participants were retired and one was a university student, the remaining participants had a variety of careers: legislator, teacher, artist, paralegal, nanny, retailer, librarian, bookkeeper, seaport operator, architect, and cleaner.

3.1 The dichotomy of life in the community

The Ironbound is known for being an immigrant Portuguese community. Participants were attracted to “the diverse cultures” in the Ironbound and the ability to “feel at home” in the community regardless of their ethnicity. One participant said, “The Ironbound is unique in terms of diverse cultures. We have the cultural parades... So the culture part of the community is nice”. Participants were also attracted to “the convenient location” of the community, and close proximity to public transportations (trains, buses, and airport). “Grocery stores”, “cultural activities”, “parks and religious and cultural organizations” were given as examples of places within walking distance in the community and there is “no need for a personal car.” Participants also rationalized their decision to remain in their home and often based their decision on the “affordability” of the community.

Despite the culture diversity and accessibility, close proximity to public transportation and housing affordability, participants had been aware of the environmental risks in their community and frustrated with the dangers they faced on a daily basis. They described five main sources of pollution in the community that they faced daily: “air,” “water,” “soil,” “light” and “noise”. Participants felt the best way to avoid pollution was to move away from the Ironbound. One participant said, “I wish I could move, but I can’t... I don’t have a place away from pollution.” Another participant discussed the affordability of housing near the Diamond Alkali Superfund Site that produced nearly one million gallons of the Agent Orange for the Vietnam War. “After a while I was like, yes, even though the rent was dirt-cheap and everything, it was like I’m getting out of here.”

The most discussed impediment to moving away from the Ironbound was the “cost.” Participants felt trapped in the community “with no choice.” One participant discussed the incinerator and her concern for the pollution it contributed to, “that’s [incinerator] what[s] motivating us to move out of [the] Ironbound...Most of the people who have lived here... a lot of people have no choice. When you come from another country...you have no choice. It’s a little trap, especially... the language. You don’t know how to communicate, how to go to other places, so you stay here.”

3.2 The experiences of reducing environmental risks

Given their awareness of environmental pollution, the participants described their perceived environmental risks, the strategies they used to cope with these risks and specific actions that they took to protect themselves. Participants identified three essential experiences of reducing environmental risks while living in the community, (1) taking personal actions to reduce environmental risks, (2) trying to work with the community to improve environmental conditions and (3) taking individual actions to improve the community’s environmental conditions. Table 1 detailed the essential intentions, the contextual intentions and the specific actions taken by participants to address their perceived environmental risks in the community.

Table 1 Essential and contextual intentions and intentional action of reducing environmental risks.

Essential Intentions	Contextual Intentions	Intentional Actions
(1) Taking personal actions to reduce environmental risks	(1a) Trying to protect hearing from noise pollution (1b) Trying to prevent sleep deprivation from noise/light exposure (1c) Trying to decrease asthmatic/allergy/respiratory exacerbation from air pollution (1d) Trying to prevent exposure to water pollution (1e) Trying to prevent exposure to contaminated soil	(1a.1) Wearing earplugs when inside/outside (1a.2) Listening to music to drown out noise (1a.3) Keeping windows in home closed (1a.4) Keeping air conditioner on to drown out noise (1a.5) Avoiding congested and loud areas outdoors (1b.1) Using light blocking blinds to prevent sleep deprivation (1b.2) Using earplugs to sleep (1b.3) Sleeping with music/TV to drown out louder sounds (1b.4) Keeping windows closed (1c.1) Closing home/car windows (1c.2) Taking alternative routes to reduce exposure to exhaust fumes (1c.3) Staying indoors (1c.4) Using air filters indoors/covering mouth outdoors (1c.5) Using medication/seeking medical advice (1c.6) Avoiding areas/parks surrounded by congestion (1d.1) Avoid, do not eat fish, swim or play near the Passaic River/Newark Bay (1d.2) Using filters on tap water (1d.3) Buying bottled water for consumption (1d.4) Avoid standing water from floods in the community

		<p>(1e.1) Avoid being near polluted soil /Brown fields/toxic sites (1e.2) Not eating vegetables from soil in the community (1e.3) Avoiding the area of the community near the incinerator (1e.4) Moving from the community to avoid pollution</p>
(2) Trying to work with the community to improve environmental conditions	<p>(2a) Trying to work with community organizations to raise awareness of environmental pollution (2b) Participating in community action to reduce pollution (2c) Trying to save parks/create more green space in the Ironbound.</p>	<p>(2a.1) Participating in community truck counting activities (2a.2) Taking air samples with community groups (2a.3) Signing petitions to ensure improved environmental conditions (2a.4) Attending protests to prevent polluting sources in the Ironbound (incinerator, medical waste incinerator, Bayonne Bridge raising, Hess power plant, etc.) (2b.1) Participating in tree planting activities (2b.2) Participating in community food co-ops (2b.3) Cleaning the Passaic River (2b.4) Working with the ICC/IBID to clean litter/plant trees/keep the neighborhood clean, green and safe (2c.1) Signing petitions/attending protests to save Riverbank Park (2c.2) Working with the ICC/Port Authority to create a new Park</p>
(3) Taking individual action to improve the community's environmental conditions	<p>(3a) Trying to keep my property/community clean (3b) Trying to prevent air pollution near my home (3c) Trying to plant/maintain greenery on/near my property (3d) Trying to organize community action (3e) Notifying Government about environmental conditions</p>	<p>(3a.1) Picking up garbage and litter in front of my property (3a.2) Trying to prevent others from littering on/near my property/community (3a.3) Posting signs outside the residence to ensure environmental conditions (3b.1) Asking truck drivers not to idle (3b.2) Asking people not to litter (3b.3) Voting in local elections (3c.1) Planting trees, bushes, flowers in the community and around my home (3c.2) Asking neighborhood businesses to plant trees (3d.1) Trying to organize a neighborhood watch group (3d.2) Organizing environmental improvement activities with neighbors (3d.3) Making a movie about saving Riverbank Park (3e.1) Reporting truck idling/noise pollution, illegal dumping, damage to green space/ trees in the community (3e.2) Speaking with local police about environmental violations (3e.3) Participating in City planning and zoning meetings (3e.4) Signing petitions (3e.5) Attending protests</p>

3.2.1 Taking personal actions to reduce environmental risks

Trying to Protect Hearing from Noise Pollution Participants were concerned about hearing damage from “planes,” “trains,” “vehicles” including “cars, trucks and buses”. Participants protected themselves from noisy “industrial activities” and general “loud noises in the community” from “restaurants,” “businesses,” the large dense population and the “stadium”. Residents described “wearing earplugs” in order to prevent being “woken up by loud noises” such as “the engines of the trucks,” “planes” “the sirens... on Market Street, the fire engines, and the ambulances”. Participants “kept the windows closed” and in addition “sometimes wore earplugs” inside their homes. Participants “put on earphones” and “listen[ed] to music” to drown out loud noises. They

regularly strategized the best ways to prevent noise pollution from affecting them. One participant described keeping a window facing the back of his home open “because it’s the back yard, so, it’s not directly in the street, we don’t get the direct smoke and stuff like that.” Participants described keeping “air conditioners on” during the day and night to “screen out the noise”.

Trying to Prevent Sleep Deprivation from Noise and Light Pollution Participants addressed sleep deprivation in the community as problematic due to “noise” and “light”. The community was described as “noisy” and “loud.” Participants were bothered by “all the sounds around, the cars and the planes.” Light and noise from “the arena” “businesses” and “streetlights” also caused sleep disruption to residents. They described installing “double curtains,” “putting pillows over their head” and “taking sleeping pills” to overcome the impacts of light pollution. Many participants used “earplugs to sleep” and some described not “being able to sleep without them”. Participants described creating more pleasant sleep inducing sounds to drown out sounds from “outside” that inhibited their sleep. Turning on the “television” or a “movie” helped mask noise pollution; participants also listened to music, or “pla[ed] a tape until they fell asleep”.

Trying to Decrease “Asthmatic” “Allergy” and “Respiratory” Exacerbation from Air Pollution Participants felt that “asthma” and “respiratory” problems were exacerbated from “air pollution in the community” and were largely attributed to “vehicular exhaust.” Participants described the visible effects of pollution which they experience daily, such as “dust” “soot” and unpleasant “odors.” Participants “closed home windows” and “car windows” when driving to prevent exacerbating asthma from exhaust. Participants left “front windows closed” to prevent air pollution from entering their homes and cars. Residents did not drive with “car windows open” to avoid “breathing in all those fumes”. One resident attempted to lessen his wife’s asthma exacerbation and “never open the windows” in the front of the house near the bus stop and prevent “all the soot comes” and black smoke” from coming in the house. Participants described “filtering outside air” and using “central air filters” and “air purifiers” to prevent outside air pollution from entering inside their homes.

Participants also took “alternate routes” when walking or driving and “avoided traffic congestion” to reduce their exposure to “exhaust fumes.” One participant with asthma said, “I usually try and stay away from that [congested] area.” Other participants discussed “walking around” or “away” from polluted areas. Some participants felt the air pollution from exhaust was at times “unavoidable” especially from overhead “planes.” At these moments participants discussed “covering their mouths,” and, or “hold[ing] their breath” to protect themselves. “Staying indoors” and “staying outside of the Ironbound” was a method to reduce exposure to air pollution.

Participants also sought “medical” advice to decrease the medical conditions they thought were caused by environmental pollution. Participants described using “medication” and seeking medical treatment for “allergies” and “respiratory problems.” One resident described her first experience with allergies “the first time I thought I was so sick, [be]cause my throat just start[ed] closing. I could not breathe and I was like, “Oh, I’m dying!” “I never had that in Brazil...when I’m feeling really bad, I take a Benadryl.”

Trying to Prevent Exposure to Water Pollution Participants tried to prevent exposure to water pollution in the community and would not “eat fish,” “swim” or “play near the Passaic River/Newark Bay Participants described the Passaic River and the Newark Bay as “horrible,” “dirty” and “gross.” One participant said “I avoid the River like the plague. I wouldn’t go near the River.” Another resident said “the River...it looks polluted and so when the thing rises, the pollution goes to the land, and then it settles in there.... So I would not move to any of those low lying areas near the River.” Residents also discussed flooding in the community as a common, historic problem in the Ironbound. One long-term resident described working near the densely packed, flood-prone industrial area. “I remember walking through flooded waters... and my boss used to give us plastic bags to put around our feet to waddle through...by the time we waddled through, if it didn’t break, whatever chemicals that

were in there ate that plastic bag.” Participants described “avoiding the flooded water in the community” during or after storms because of “disease” “toxins” and “contamination” in the water. Hurricane Sandy occurred during the interviews and participants described the flooded water from the storm as a “toxic mix” with possible “carcinogens.”

Trying to Prevent Exposure to Contaminated Soil Contaminated soil from past industrial practices is pervasive in the Ironbound. Some participants who knew the history of the community actively avoided what they perceived to be “contaminated areas” and would not “drive down the street near the incinerator.” Residents said they “would not live near” or “on properties” in the community which were “built on contaminated soil” for fear of contamination “seeping” up from the soil and causing “cancer” “disease” or other “health problems.” In order to protect their health some residents did not “plant vegetable gardens on the soil in the community.”

3.2.2 Trying to work with the community to improve environmental conditions

Participants realized that living in an EJ community and being exposed to environmental risks necessitated engagement beyond their personal actions to reduce their environmental risks. When being asked about the efforts “collectively” and “individually” to reduce environmental risks, one participant said, “it’s necessary to have collective action in anything and the only reason that the Ironbound is what it is, is because the few people in the Ironbound that pull it together.”

Most participants acknowledged working with “others” or “in a group” as the most effective method of achieving environmental improvement in the Ironbound. Participants discussed activities that they participated in to raise environmental awareness in the community. The Ironbound Community Corporation (ICC) was a strong advocate for environmental justice in the community and led many environmental advocacy activities in which local residents participated. Participants “conducted truck counts” to track the amount of trucks which pass through the community. Participants also used “petitions” and “protests” as a means to notify the city government of their environmental concerns. Participants discussed “signing petitions” about lack of “park space,” “saving Riverbank Park,” “cleaning the contamination in Riverbank Park,” the placing of the “incinerator” in the community and “building playgrounds for children” at community schools.

The lack of sufficient “park space” and “green space” in the community was a concern for participants. Participants who had lived in the community in the late 1990’s recalled efforts of “signing petitions” and attending “protests” to save the Riverbank Park from being developed into a baseball stadium. Participants identified participating in local elections by “voting” as an important action to empower the community as a whole. Participants discussed the importance of “voting” that helped save Riverbank Park. Participants also discussed collective efforts to “save” and “create park space” for children in school and the necessity for the community to “organize” in order to be more powerful. Participants also discussed numerous collective activities in the community to improve the environment and living conditions in the community such as “planting more and more trees” “installing “planters” on town property, “community food co-ops” and “farmer’s markets.”

Participants also discussed involvement in “Community Action Groups” and “conservation groups” to clean up the Passaic River. One teacher in the community discussed working with students to “raise environmental awareness” and perform environmental cleanup activities. Participants also worked collectively to clean litter and keep the neighborhood “clean,” “green” and “safe.”

3.2.3 Taking individual actions to improve the community’s environmental conditions

Participants conducted individual actions to keep their properties and the community “clean.” Participants described “frustration” and “anger” at the apathy of community members who allowed the community gets so “dirty.” One participant said “I’m always catching, getting garbage from the streets and put[ing it] in a bag or bring[ing it] home, or finding a place to throw it out.”

Participants described the pervasiveness of “littering” and “illegal dumping” in the community and took individual actions to prevent them. One participant described his family efforts to report illegal dumping; “my mother took it upon herself to call code enforcement and let them know what was going on.” Residents “put up signs” to prevent illegal dumping, they “spoke to” and “yelled” at people that they believed were illegal dumping in an effort to improve the community. Participants took the “license number down” of someone who was illegally dumping in the community in an effort to “report the crime.” One resident described her effort to prevent illegal dumping: “a couple times I pretended I’m taking a picture with my camera and they jump into their cars and they take off.”

Residents conducted individual action to increase “green space” in the community through “tree planting” and “planting flowers” in the community. A participant described his efforts to improve commercial “parking lots;” “The parking lot guy is going to let me do gardening on his parking lot...Fine, I can’t get him to [not] make a parking lot, so let’s make the parking lot look nice!”

In addition to their own individual action to physically improve the community, participants described trying to galvanize others to make improvements. Participants organized “neighborhood watch groups” to prevent “graffiti,” “littering,” report a “broken street light” which make “the neighborhood seem like its cared for.” Participants also individually used their talents to publicize community activism. One participant called her individual effort of making a film about the fight for saving Riverbank park; “the Riverbank Park, you know how much hassle went into fighting to keep Riverbank Park?...I made a film about it and I used it, I exhibited the film at the [Newark] museum.”

Air pollution from “vehicle idling” was a concern for participants. Participants asked drivers not to “idle” their vehicles in front of residential properties. One participant said, “I’m always calling the Police and giving them a hard time because they park down by the Park...and they run their engines and their air conditioning ...for their heaters.”

One participant described her efforts of reducing light pollution in the community originating from electronic signs at the Prudential Arena. “[I wrote to] the councilmen, and then I wrote to Prudential about it, the arena, and nothing happened. The councilmen thought that I was being ridiculous.”

Participants described individual efforts of “attending City meetings” to express concerns regarding development that would negatively affect the environmental conditions in the community. One participant described the “fighting” on the incinerator; “there were tons of meetings...we went to...council meetings...and they wouldn’t let people talk...it was like they would shut you down. A few people got up to talk, and then that would be it.”

4 Discussion

Risk analysis is a management tool used to develop regulatory policies to address environmental and health impacts of environmental hazards in the U.S. and has been applied to address the health and environmental risks in EJ communities where residents often face multiple environmental hazards on a daily basis (Logue, 2011; Su, 2009; Walker, 2010). However, risk analysis that focuses on large-scale quantification of environmental risk is limited in shaping effective policy and in its implementation to reduce environmental risks in EJ communities (Bowen, 2002; Callahan and Sexton, 2007; Collins et al., 2011; NRC, 2011). Risk analysis does not capture large amounts of small, non-dominant environmental air toxins generated near residential communities with significantly elevated level of environmental risk (Lejano and Smith, 2006). Risk analysis does not capture individuals’ experience of how they manage their daily lives to reduce environmental risks (Krieg and Faber, 2004; Sherif, 1991; Turaga et al., 2011; Walker, 2010). The participants in the study perceived various environmental risks including “air” “noise”, “light”, “litter”, and “water” as major threats to

their wellbeing. Most of those risks are small in scale and local in space and would not be captured in large-scale risk analysis.

Participants' perception of environmental risks did help empower them to perform collective action to improve their environmental conditions in their community. Because the voice of one individual was described by many participants as "ineffective" in opposition to large forces such as "corporations" or the "city" government, participants felt it was necessary to "be part of a group" to effectuate positive environmental progress. Participants described their efforts to participate in collective action, what motivated them to do so and if their efforts were effective. The collective actions did have some success in achieving desirable outcomes for the community. Participants described organizing on an "individual" or "community" level to defeat proposed sources of environmental risks, such as the previously proposed "medical waste incinerator" and "tire incinerator." However, participants also gave account of their frustration for not being able to defeat projects that would exuberate environmental risks to the community. Residents in the Ironbound opposed the raising of the Bayonne Bridge, which would allow the crossing of larger ships and subsequent vehicle traffic in the community. The community opposition to the Bridge project failed even though the Federal Government extended the comment period to specifically review the considerations of the residents in the community (EELC, 2013). Participants also discussed opposing the City Planning Board's approval of the Hess Corporation's natural gas power plant in the Ironbound. Residents attended the Planning Board meetings and organized in opposition to the proposed plant that was ultimately approved in 2012 (Giambusso, 2012).

Despite their individual and collective actions of reducing environmental risks, participants generally felt the impacts of their actions are limited because of the pervasiveness of the environmental hazards in their community and the lack of proper cooperation and functioning of local, city and state governments. One participant asked "why always the Ironbound" and this theme was reiterated by many other residents of the community. Participants were discouraged by the lack of support from local governments and felt "the city was going to do what it wanted to do anyway." Participants in this study did not feel that the local government was concerned with the environmental pollution in the community or the effect that such pollution had on human health. Participants did not have faith in their elected officials and described feeling City Government was "corrupt," "non-responsive" and that they "did not care" about resident's concerns. Participants described numerous incidents of efforts they made to engage their local government in the positive improvement of the community, such as "calling to report pollution," "participating in public meetings," "signing petitions" and "participating in local elections." They described the City Government as "unavailable," which was epitomized in this digital age by the City webpage that did not provide opportunities to email officials, post messages or leave comments about the community.

5 Conclusions

The study used a descriptive phenomenological approach to uncover residents' rich and detailed experiences of living in an EJ community in terms of individuals' intention, interpretation, and action in response to their experience of reducing environmental risks; Such individuals' insights and opinions from the residents' perspective, are essential to make and implement community-specific policy and planning to improve individuals' quality of life in an EJ community. This study is among the first application of the descriptive phenomenological approach in understanding the lived experiences of residents in EJ communities. Despite using an interview method as other qualitative research does, the descriptive phenomenological approach takes special caution in developing the interview questions and conducting the semi-structured interviews to "bracket" conventional knowledge and researchers' own prejudgments to give the participating residents a

bias-free environment to express their genuinely multifaceted experience of reducing environmental risk while living in the EJ community.

Through the identification and documentation of the underlying causes of actions taken by residents, this study developed a more complete picture of an EJ community regarding the dynamic relationship among local governments, social organizations and individuals in dealing with environmental risks. Residents in EJ communities experience a dichotomy between the positive aspects of their community, such as “affordability,” “proximity to public transportation,” “cultural affinity” and the negative aspects of “air,” “water,” and, “light” and “noise” pollution. Instead of being passively affected by the environmental hazards in their community, the participants in the study tended to take active role to reduce the environmental risk as either an individual or a member of an organized community. As shown in the study, the environmental risks perceived and dealt with by the local residents in EJ communities are not entirely congruent to the environmental risks concerned and categorized by the government. A well-functioning local government is essential to improve the residents’ experiences and eventually their quality of life of living in EJ communities. Future EJ research should focus on strategies that incorporate the individuals’ perceptions and intentions into development of localized community specific environmental policy for EJ communities. Such policy should consider the true impacts of multiple pollution sources on those living in the community within the context of the strategies that resident’s take on a daily basis to protect their health and wellbeing. Within such a context individuals’ intentions will be improved and residents can better protect themselves and their families from exposure to environmental risks. Future EJ policy should also incorporate local governments and strength the functioning of local governments in reducing environmental risks in EJ communities (EPA, 2011).

Although this study produced rich and vivid descriptions of the residents’ experience of reducing environmental risks in an EJ community, the experiences of the 23 participants in this study shall not be generalized as representing the experiences of residents in all EJ communities. By the very nature of the interview and phenomenological method, the researcher is an instrument and bias is possible.

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References

- Altschuler A, Somkin C, Adler N. 2004. Local services and amenities, neighborhood social capital, and health. *Social Science & Medicine*, 59: 1219-1229
- ApSimon HM, Warren F, Kayin S. 2002. Addressing uncertainty in environmental modeling: a case study of integrated assessment of strategies to combat long-range transboundary air pollution. *Atmospheric Environment*, 36: 5417-5426
- AtariDO, Luginaah I, Baxter J. 2011. ‘This is the mess that we are living in’: residents everyday life experiences of living in a stigmatized community. *GeoJournal*, 76: 483-500
- Bass R. 1998. Evaluating EJ under the National Environmental Policy Act. *Environmental Impact Assessment Review*, 18: 83-92
- Beaumont R, Hamilton R, Machin N, Perks J, Williams I. 1999. Social awareness of air quality information. *The Science of the Total Environment*, 235: 319-329

- Bell M, O'Neil MS, Cifuentes LA, Braga ALF, Green C, Nweke A, Rogat J, Sibold K. 2005. Challenges and recommendations for the study of socioeconomic factors and air pollution health effects. *Environmental Science & Policy*, 8: 525-533
- Bickerstaff, K. 2004. Risk perception research: socio-cultural perspectives on the public experience of air pollution. *Environment International*, 30: 827- 840
- Bowen W. 2002. An analytical review of EJ research: what do we really know? *Environmental Management*, 29: 3-15
- Brody S, Peck B, Highfield W. 2004. Examining localized patterns of air quality perception in Texas: a spatial and statistical analysis. *Risk Analysis*, 24: 1561-1574
- Callahan MA, Sexton, K. 2007. If cumulative risk assessment is the answer, what is the question? *Environmental Health Perspectives*, 115: 799-806
- Casey ES. 2009. *Getting Back into Place: Toward a Renewed Understanding of the Place-World* (2nd ed). Indiana University Press, Indiana, USA
- Ceaser D. 2015. Significant life experiences and environmental justice: positionality and the significance of negative social/environmental experiences. *Environmental Education Research* (Forthcoming)
- Collins T, Grineski S, Chakraborty J, McDonald YJ. 2011. Understanding environmental health inequalities through comparative intracategorical analysis: Racial/ethnic disparities in cancer risks from air toxics in El Paso County, Texas. *Health & Place*, 17: 335-344
- Cresswell T. 2004. *Place: A Short Introduction*. Blackwell, Oxford, UK
- Cupples, J. 2009. Culture, nature and particulate matter – Hybrid reframings in air pollution scholarship. *Atmospheric Environment*, 43: 207-217
- Donohoe J. 2014. *Remembering Places: A Phenomenological Study of the Relationship between Memory and Place*. Lexington Books, New York, USA
- EELC (Eastern Environmental Law Center). 2013. Bayonne Bridge Raising & the Environmental Justice Impact. 23 Jan 2013. Available: <http://www.easternenvironmental.org/bayonne-bridge-raising-the-environmental-justice-impact/>. Accessed on April 16, 2014
- EPA (Environmental Protection Agency). 2010. EPA's Action Development Process Interim Guidance on Considering Environmental Justice During the Development of an Action. July 2010. Available: <http://www.epa.gov/environmentaljustice/resources/policy/considering-ej-in-rulemaking-guide-07-2010.pdf>. Accessed April 2, 2014
- EPA (Environmental Protection Agency). 2011. Plan EJ 2014. Office of Environmental Justice. U.S. EPA, Washington DC 20460, USA
- Fu MR, Rosedale M. 2009. Breast cancer survivor's experience of lymphedema related symptoms. *Journal of Pain Symptom Manage*, 38: 849-859
- Giambusso D. 2012. Hess power plant gets approved for Newark's Ironbound despite outcry from residents. *NJ.com*. 10 May 2012. Available: http://www.nj.com/news/index.ssf/2012/05/hess_power_plant_gets_approved.html Accessed April 19 2014
- Gilbert A, Chakraborty J. 2011. Using geographically weighted regression for environmental justice analysis: Cumulative cancer risks from air toxics in Florida. *Social Science Research*, 40: 2730-2860
- Hipp J, Lakon C. 2010. Social disparities in health: Disproportionate toxicity proximity in minority communities over a decade. *Health & Place*, 16: 674-683

- Holifield RB. 2004. Neoliberalism and environmental justice in the United States environmental protection agency: Translating policy into managerial practice in hazardous waste remediation. *Geoforum*, 35: 285-297
- Husserl E. 1962. *Ideas: General Introduction to Pure Phenomenology*. Macmillan, New York, USA
- Krieg E, Faber D. 2004. Not so black and white: EJ and cumulative impact assessments. *Environmental Impact Assessment Review*, 24: 667-694
- Lejano RP, Smith C. 2006. Incompatible land uses and the topology of cumulative risk. *Environmental Management*, 37: 230-246
- Lejano RP, Stokols D. 2010. Understanding minority residents' perceptions of neighborhood risks and EJ: new modalities, findings, and policy implications. *Journal of Architectural and Planning Research*, 27: 107-123
- Lejano RP, Leong C. 2012. A hermeneutic approach to explaining and understanding public controversies. *Journal of Public Administration Research and Theory*, 22(4): 793-814
- Logue J, Small M, Robinson A. 2011. Evaluating the national air toxics assessment (NATA): Comparison of predicted and measured air toxics concentrations, risks, and sources in Pittsburgh, Pennsylvania. *Atmospheric Environment*, 45: 476-484
- Malpas JE. 2007. *Place and Experience: A Philosophical Topography*. Cambridge University Press, UK
- Mitchell G, Norman P. 2012. Longitudinal EJ analysis: co-evolution of environmental quality and deprivation in England, 1960–2007. *Geoforum*, 43: 44-57
- Mugerauer R. 1994. *Interpretations on Behalf of Place*. State Univ. of New York Press, New York, USA
- Morse JM. 1994. *Critical Issues in Qualitative Research Methods*. Sage Publications Inc., California, USA
- Moser G. 2009. Quality of life and sustainability: Toward person–environment congruity. *Journal of Environmental Psychology*, 29: 351-357
- Northridge M, Stover G, Rosenthal J, Sherard, D. 2003. Environmental equity and health: understanding complexity and moving forward. *American Journal of Public Health*, 93: 209-214
- NRC (National Research Council). 2011. *Improving Health in the United States: The Role of Health Impact Assessment*, National Academy Press, Washington DC, USA
- Pluhar Z, Piko B, Kovacs S, Uzzoli A. 2009. Air Pollution is bad for my health: Hungarian children's knowledge of the role of environment in health and disease. *Health & Place*, 15: 239-246
- Porter EJ. 1998. On "being inspired" by Husserl's phenomenology: Reflections on Omery's exposition of phenomenology as a method of nursing research. *Advances in Nursing Science*, 21: 16-28
- Ragas M. 2011. Cumulative risk assessment of chemical exposures in urban environments. *Environment International*, 37: 872-881
- Renn, O. 2003. Social Amplification of risk in participation: two case studies. In: *The Social Amplification of Risk* (Pidgeon N, Kasperson RE, Slovic P, eds). 374-401, Cambridge University Press, Cambridge, USA
- Ralph E. 1976. *Place and Placelessness*. Pion, London, UK
- Seamon D. 2013. Lived bodies, place, and phenomenology: implications for human rights and environmental justice. *Journal of Human Rights and the Environment*, 4: 143-66
- Seamon D. 2014. Place attachment and phenomenology: the synergistic dynamism of place. In: *Place Attachment: Advances in Theory, Methods and Research*. (Manzo L, Devine-Wright P, eds). 11-22, Routledge/Francis & Taylor, New York, USA
- Sherif Y. 1991. On risk and risk analysis. *Reliability Engineering & System Safety*, 31: 155-178
- Sokolowski R. 2000. *Introduction to Phenomenology*. Cambridge University Press, Cambridge, USA
- Stefanovic IL. 2000. *Safeguarding Our Common Future: Rethinking Sustainable Development*. State University of New York Press, New York, USA

- Su J, Morello-Frosch R, Jesdale B, Kyle A, Shamasunder B, Jerrett, M. 2009. An index for assessing demographic inequalities in cumulative environmental hazards with application to Los Angeles, California. *Environmental Science & Technology*, 43: 7626-7634
- Turaga R, Noonan D, Bostrom A. 2011. Hot spots regulation and EJ. *Ecological Economics*, 70: 1395-1405
- Van Manen M. 2014. *Phenomenology of Practice*. Left Coast Press, California, USA
- Veenstra G, Luginaah I, Wakefield S, Birch S, Eyles J, Elliott S. 2005. Who you know, where you live: social capital, neighbourhood and health. *Social Science & Medicine*, 60: 2799-2818
- Walker G. 2010. EJ, impact assessment and the politics of knowledge: the implications of assessing the social distribution of environmental outcomes. *Environmental Impact Assessment Review*, 30: 312-318
- Wakefield S, Elliott S, Cole D, Eyles J. 2001. Environmental risk and (re)action: air quality, health, and civic involvement in an urban industrial neighborhood. *Health & Place*, 7: 163-177
- Wakefield S, McMullan C. 2005. Healing in places of decline: (re)imagining everyday landscapes in Hamilton, Ontario. *Health and Place*, 11: 299-312
- Wilkinson C. 1998. EJ impact assessment: key components and emerging issues. In: *Environmental Methods Review: Retooling Impact Assessment for the New Century* (Eds. AL Porter and JJ Fittipaldi). 273-282, The Press Club, North Dakota, USA