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ABSTRACT

The purpose of this qualitative multi-case study is to explore the beliefs and perceptions of millennials on the subjects of climate change and sustainability. Some millennials pursuing an undergraduate degree in a non-environmental science field may lack knowledge pertaining to climate change and sustainability. The conceptual framework for this qualitative explanatory multi-case study is grounded in contributions from Henri Lefebvre, Nicholson-Smith (1991), and Simpson (2014) who explore how the notion of space has evolved in recent years, as well as researchers who are quantitatively studying climate change and sustainability. I conducted semi-structured focus groups and drafted field notes from two universities in Northern New Jersey. The purposeful sample consists of 14 participants. Interviews were transcribed and imported into NVivo 12 Pro. I utilized NVivo 12 Pro in order to organize data and assign codes which led to the emergence of four themes: (a) knowledge and understanding; (b) generations and responsibility; (c) awareness, political power, and purchasing power; and (c) affect and importance. Findings from this study suggest that millennials utilize social media to obtain information pertaining to climate change and sustainability. Findings also indicate that millennials who are non-environmental science majors lack the requisite knowledge regarding climate change and sustainability. In light of this study's findings, some recommendations are seen in chapter 5.

MONTCLAIR STATE UNIVERSITY
BELIEFS AND PERCEPTIONS OF MILLENNIALS
PERTAINING TO CLIMATE CHANGE AND SUSTAINABILITY

By

Rae Cade

A Master's Thesis Submitted to the Faculty of

Montclair State University

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BELIEFS AND PERCEPTIONS OF MILLENNIALS
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A THESIS

Submitted in partial fulfillment of the requirements
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Chapter 1

Introduction

For many years, in terms of sustainability, people regarded the United States as the center of inventiveness (Kuhlman & Farrington, 2010). However, what exactly is sustainability? As a term, sustainability has gradually become common when addressing research concerned with policies which depict representations of what public policy achievements should be (Kuhlman & Farrington, 2010). The forest industry utilized the term sustainability until approximately 1931 (Kuhlman & Farrington, 2010). In that, individuals previously referred to sustainability as reaping more than a given forest can replenish in a single growth period (Kuhlman & Farrington, 2010). Typically, sustainability is described in terms of the “3E’s”: ecology, economy, and equity. Sustainability is now described as encompassing a wide array of factors that is inclusive of economic development, social inequality, as well as the history and practices of various cultures (Chan, 2018). While culture and cultural practices are often utilized in various contexts, such as politics, policy, and a historical perspective, attempts to methodically merge culture and sustainability is limited (Soini & Dessein, 2016).

While countries focus on climate mitigation, they are also researching how to incorporate sustainability into their policies (Wagner & Andreas, 2012). While many researchers focus on technological solutions in response to climate change, Wagner and Andreas (2012) indicate that there is also research pertaining to socio-ecology which intends to foster approaches for social sustainability. By developing such approaches, connections are made between social justice, economic demands, as well as economic or environmental transformations. Additionally, Wagner and Andreas (2012) indicate that existing research tends to place emphasis on individual parts of sustainability instead of sustainability as a holistic approach to environmental

management or lifestyle. Researchers view social sustainability as either addressing society's "basic" needs, changing societal behavior, or preserving and protecting our socio-cultural ways of living/traditions (Vallance, Perkins, & Dixon, 2011).

Gray, Raimi, Wilson, and Árvai (2019) investigate whether or not millennials are more concerned about the environment than their predecessors. Previous research indicates that older generations are less likely to act on environmental issues, when compared to younger generations. This lack of action and concern is partly due to the fact that older generations attempt to preserve their social standing in the dominant social order (Gray, Raimi, Wilson, & Árvai, 2019). While Gray, Raimi, Wilson, and Árvai (2019) indicate that millennials are more likely to be actively engaged in climate change, Monyei and Oladeji (2019) indicate that uncertainties arise in terms of whether or not millennials have the necessary knowledge and understanding needed to sustain humanity with the Earth's changing climate. Some research suggests that millennials are more willing to become actively engaged in climate change as opposed to their older counterparts. However, there is limited research that explores the perceptions about climate change and sustainability amongst millennials. The purpose of this study is to explore the beliefs and perceptions of millennials on the subjects of climate change and sustainability.

Background

Space and Nature

Climate change is a global phenomenon that is detrimental to humanity and its way of life. However, this is not apparent to everyone. In order to understand why the urgency of climate change is not apparent, we must first understand how people perceive the conception of space and nature (Smith, 2008). While the concept of "nature" is socially constructed and space

is individually perceived, they are actively being reinforced socially which impacts how we view climate change. Given that climate change is such a large phenomenon and challenging to some, the active reinforcement of the socially constructed concept of space needs to be taken into consideration.

Climate change is a global issue, but one characteristic of climate change that is rarely addressed is the changes that can potentially be witnessed if the Earth experiences warming beyond 2°C (Wells, 2019). Wells (2019) hypothesizes that the lack of addressing the habitability of our planet if it warms beyond 2°C might be due to fear, fearmongering, market faith, skepticism, or perhaps debates. Wells (2019) describes market faith as encompassing trust in economic productivity that developed countries experience. The lack of choice in addressing climate change places populations at risk.

Farmers are one population at risk of climatic changes (Jamshidi, Asadi, Kalantari, Azadi, & Scheffran, 2019). Jamshidi, Asadi, Kalantari, Azadi, & Scheffran (2019), anticipate that crops will be impacted by pest and disease outbreaks, crops will perish, and there will be an increase in the mortality of livestock due to climate change. Perhaps it is the impending vulnerability of humanity that the future habitability of our planet is not addressed (Jamshidi, Asadi, Kalantari, Azadi, & Scheffran, 2019). Wells (2019) also indicates that while scientists warn of rising temperatures and the increased risks, the “outside world” appears unchanged. The outside world in this case appears to be a socially constructed version of our perceived space. Newman (2015) references the French Philosopher Henri Lefebvre who addresses the production and formation of space, while referring to the socially constructed boundaries that exist between the natural and constructed environments.

Lefebvre stated that the notion of production is essentially abstract. There are certain questions that an individual or group of individuals must ask themselves. Questions such as: what is produced, how is it produced, why it is produced, who is it produced for, as well as who produces it (Nicholson-Smith, 1991)? These questions are essential in understanding the production of various spaces because the concept of space was transformed throughout history. Nicholson-Smith (1991) cited Lefebvre in stating that the concept of space was solely utilized in a geometrical sense, which conjured an empty space image. Until recently, the formation of the concept of social space was not common. Social space as defined by Sundstrom (2003) is composed of our daily practices and experiences. It is the space that is the outcome of social organization because humans tend to experience space through social interactions (Sundstrom, 2003).

The way in which individuals conceive nature as a whole seemingly occupies a form of space that is separate from their daily lives which can be a result of their reflection in terms of their social experiences (Smith, 2008). While humans tend to experience and create space through social interactions, it seems as though their creation is reified through experience. According to Smith (2008), it appears as though society is currently separate from nature unless depicting how society has mastered nature. This mastery of nature can also be employed when analyzing how nature is commodified for activity purposes such as hiking, camping, picnicking, etc. Smith (2008) addresses a “back to nature movement” in terms of a “playground” for groups within society and describes nature as being romanticized. In that, groups who reside in a built environment within society choose when to return to nature for yearly excursions.

Smith (2008) indicates that the concept of “nature” is socially constructed. Coupled with the romanticization of nature is the perception or belief that nature needs to be continuously

mastered and objectified in order to benefit humans alone (Smith, 2008). This ideology relates to the romanticization of the back to nature movement. Smith (2008) indicates that this particular movement can be perceived as “wishful thinking”. Perhaps this is due to the fact that this movement can insinuate a unity between humans and nature. In a period in which anthropogenically induced rising CO₂ levels threaten life on Earth, can we truly be unified with nature?

While Smith (2008) and Lefebvre, cited in Nicholson-Smith (1991), are certainly a western view of the concept of nature, there is also an indigenous ideology of nature that needs to be highlighted. Much of what I have discussed in this section describes an invisible boundary in which humans have separated themselves from the nature surrounding them. Conversely, Simpson (2014) pointed out that if nature can be viewed through an indigenous perspective, we might find that there is no boundary between humans and nature. In that, western thinking highlights a mastery of nature; whereas Simpson (2014) highlights indigenous communities working in harmony with nature and learning from the environment in such a way that does not convey dominance over it. While millennials promote environmental actions through social movements, the requisite knowledge pertaining to harmony with nature and learning from nature as well as how daily actions impact the environment may or may not be missing (Monyei & Oladeji, 2019).

Social Media and the Production of Space

While considering how space and nature is socially conceived and perceived, it is important to take into consideration the use of social media. This can assist in understanding how social media reduces geographical distance by conceptualizing the idea of the production of space through it. The advancement, ownership, and utilization of social media drastically

increased with approximately 97% of individuals between the ages of 18-29 owning cell phones in 2016 (Rebold, Sheehan, Dirlam, Maldonado, & O'Donnell, 2016); however, this percentage is likely to have increased within the last four years. The ability to travel with cell phones and the connect-ability to cell phone applications aids in the ability to instantly connect to social media at any point throughout an individual's day (Rebold et al., 2016). This can be seen in individuals repeatedly logging into their social media accounts in order to "check" whether or not new information has been uploaded or posted on their account feeds (Firth et al., 2019) This connectivity assists in allowing users to witness first-hand events through their cell phones.

Climate change is a vast and complex issue that some are unable to grasp unless witnessed first-hand or are educated on the issue through formal education (Schäfer & Schlichting, 2014). According to Schäfer and Schlichting (2014), this is due to various reasons. One reason that is indicated is that the effects of climate change is on a large spatial scale that many individuals have trouble fully grasping the magnitude of climate change because the extent of it lies far beyond the ability to perceive it (Schäfer & Schlichting, 2014). While climate change is challenging to perceive for some, the media has often been valuable in communicating climate change to society (Schäfer & Schlichting, 2014). With the rapid advancement of cell phones, the ability to communicate is increasing. According to Veil, Buehner, and Palenchar (2011), approximately 31% of adults utilized various online platforms in order to communicate information and opinions. Recent studies indicate that roughly 95% of Americans possess cell phones and approximately 30% of Americans constantly access the internet via their cell phones (Volkmer & Lerner (2019).

Online platforms are instrumental in advancing the concept of space and are now utilized to distribute information. First-hand reporting of various forms of disasters and crises only

requires a cell phone with access to the internet to share information over what is known as virtual space (Veil, Buehner, & Palenchar, 2011). By occupying virtual space in a virtual world, social media users are rapidly viewing and sharing first-hand experiences. The question that remains is, what exactly is virtual space? Saunders, Rutkowski, Genuchten, Vogel, and Orrego (2011) define virtual space as being occupied within a virtual world. The virtual world is a digital environment which various organizations, groups and individuals interact within nonphysical spaces. More definitively, virtual worlds are also defined as an electronic environment which can imitate tangible spaces where individuals can interact and replicate spaces in a virtual setting (Saunders, Rutkowski, Genuchten, Vogel, & Orrego, 2011).

By occupying virtual space, public awareness can be raised for certain issues. Hamid, Ijab, Sulaiman, Anwar, and Norman (2016) indicated that behavioral change is either brought about by raising awareness to issues or by reviewing decisions that have been, or will be, made and act based on economic self-interest. Hamid et al., (2016) also indicate that the utilization of social media to convey and raise sustainability awareness is not fully grasped. Millennials converse on various social media platforms about topics pertaining to the environment including climate change and sustainability (Anderson & Öhman, 2017). While the topics that are discussed are reportedly “generic”, can actions still be taken when graphic footage is depicted?

For years, plastic straws were sold globally with little social attention to the environmental repercussions of the material they were made from. While there are numerous commodities which negatively affect the environment, a single video depicting the negative effects of humanity’s consumption on the environment went viral resulting in an increase in attention on plastic straws. Roughly four years ago, social media users were exposed to the disturbing truth that human actions do have a ripple effect on neighboring ecosystems. Figgner

(2015) uploaded a video that was viewed by a plethora of individuals on social media. This video showed a sea turtle with a straw wedged in its nose. An individual is seen attempting to remove the wedged straw with what appears to be a small plier. The sea turtle can be seen squeezing its eyes closed at times and writhing in apparent pain, causing the individuals to have to strengthen their grip on the sea turtle while holding it down (Figgenger, 2015). Gradually, the straw comes into the viewers sight as it is slowly pulled out of the sea turtle's nostril; it is dull and deformed. After five minutes, the straw is still lodged inside of the sea turtle's bleeding nostril. Resuming the struggle of dislodging the straw from the sea turtle's nostril, fresh blood begins to seep out of the nostril of the writhing and hissing sea turtle. When the video reaches the eight-minute mark, the dull and deformed straw is finally dislodged from the sea turtle and it is shown to the camera (Figgenger, 2015).

With the distribution of this graphic video, social awareness in relation to actions or lack of action increased, resulting in an increase in social activism. This increase in awareness was demonstrated in my focus group where participants raised the issue of plastic straws in relation to the viral turtle video. However, as Karahan and Roehrig (2015) highlight, social activism stems from individuals claiming responsibility and taking action in relation to societal issues and swaying the choices and actions of others. However, prior to actions taking place, society should understand not only social issues, but also environmental issues. Moreover, current research highlights a strong association between increased awareness and actions. This is important to take into consideration when addressing environmental issues because the perceptions of individuals are influenced by the media. Individuals are daily subjected to not only written information, but also visual information that pertains to social and environmental information through virtual space (Karahan & Roehrig, 2015).

Many millennials obtain environmental knowledge via various means, one of which is virtual space (Karahana & Roehrig, 2015). Data indicated that roughly 48% of younger Americans received their news via social media in 2015. By receiving news reports through this platform, researchers presumed that viewers had increased understanding and awareness as a result of seeing these reports. As a result, Karahan & Roehrig (2015) called for an integration of social media into the learning process of students in order to glean a better understanding of environmental issues, attitudes, as well as awareness. This information is useful in understanding how information is received on social media. Sandoval-Almanzan and Gil-Garcia (2014) informed readers by stating that, with the assistance of satellites, information is spread worldwide on social media within minutes which keeps individuals informed about the various occurrences across the globe. This can be related back to the occurrence of the sea turtle which had a straw lodged in its nostril. With the widespread knowledge of the dangers that plastic can have on various ecosystems, many states began taking the initiative to ban plastic bags (Wagner, 2017).

With the rapid expansion of technology, researchers believe communication can rapidly increase (Sapacz, Rockman, & Clark, 2016). Additionally, social media's ability to utilize the internet to constantly grasp user's attention is a field that needs to be studied and is reiterated by Firth et al. (2019). Is it also possible that the expansion of technology plays a role in individuals rapidly obtaining information? Individuals constantly travel with their cell phones, and in doing so they are able to communicate, access the wireless internet, navigate, take photographs, listen to music, watch videos, play games, etc. (Sapacz, Rockman, & Clark, 2016). This constant connectivity that is made possible through cell phone utilization is so prominent that Sapacz, Rockman, and Clark (2016) indicated that millennials begin to experience a sense of anxiety if

their cell phones are not near them or at the thought of not having a cell phone. Has cell phone utilization become so ingrained in millennial culture?

While it is certainly possible that an increase in cell phone use must be taken into consideration when exploring millennials, the negative aspects of cell phones must also be highlighted. In 2019, researchers reported that 95% of American adults owned a cell phone. Of this 95%, it was also reported that roughly 77% of Americans between the ages of 18 and 25 years old owned a smartphone. (Coyne, Stockdale, & Summers, 2019). The rapid advancement of cell phones and the need to travel with them results in what some researchers deem as cell phone addictions. Researchers explored how individuals reported that cell phones became distracting and reported a sense of overdependence of their cell phones (Coyne, Stockdale, & Summers, 2019). With this overdependence of cell phones, the question to consider is, how do millennials acquire information pertaining to climate change and sustainability? Do millennials opt to attain this information from reading journal articles, or do they rely on their cell phones for information which can be obtained through social media?

Climate Change in Human Space

The global phenomenon of climate change will result in regional changes across the globe. Researchers are now faced with challenges in bridging the gap between climatic changes and the general public. The supporters of the Kyoto Protocol indicated that global temperature should not surpass 2°C due to the potential for global catastrophic outcomes, such outcomes pertained to urban flooding, devastating droughts, and heat waves (Wells, 2019). Additionally, Wells (2019) indicates that hurricanes, which would previously have been deemed “natural disasters”, will soon become normalized as simply cruel weather if global emissions continue rising at their current rates. The odds of avoiding such anomalies seems to dwindle as emissions

continuously rise (Wells, 2019). Since supporters signed the Kyoto Protocol twenty years ago, global emissions have increased. As a result, global leaders attempted to establish another agreement. This agreement, founded in 2016, was the Paris Agreement in which 2°C was once again set as a global goal. However, Wells (2019) suggests that the global goal for 2°C is appearing to be seen as a “best case scenario”.

This best-case scenario is widely promoted to the public, but what will occur if global warming exceeds 2°C? The occurrences that will result from exceeding 2°C is masked from the public in such a way that exceeding the goal of 2°C is imperceivable (Wells, 2019). Perhaps it is out of fear that the exceeding of 2°C is not discussed, skepticism, lack of interest, or even confusion pertaining to the environmental data. Perhaps it is also because the immediate outdoors appears unchanged (Wells, 2019). Environmental data indicates that if global action is not taken in accordance with the Paris Agreement, not only will the Earth’s warming exceed 2°C, it will also warm to roughly 3.2°C (Wells, 2019). Coupled with rising temperatures, the collapsing of the ice sheets will no longer be something to imagine, but something to be seen. The collapsing of the ice sheets will then result in many cities being inundated with water, such as: Miami, Hong Kong, New York, and Shanghai (just to name a few) (Wells, 2019).

Phrases are often utilized so that individuals are able to comprehend the magnitude or the extent to which climatic changes will alter the environment. Wells (2019) highlights a common phrase that is often utilized by teachers in academic settings to describe how the Earth has changed over time: “*the last time the planet was this much warmer...sea levels were here*”. Can the average person comprehend the degree to which the environment has changed? Leiserowitz (2006) indicated that American citizens largely agree that climate change is a major concern; however, when compared to national precedence climate change falls short. Leiserowitz (2006)

stated that cultural theorists argue that when analyzing risk perception and behavior, social values and worldviews plays a key role. In that the way in which individuals perceive the world is guided by social, cultural, as well as political attitudes. These attitudes can influence responses towards complex situations such as climate change.

To better understand the risk or danger of exceeding a 2°C threshold, Wells (2019) explains the possibilities that can occur. Often, the consequences of exceeding 2°C is discussed. In that the ice sheets will collapse and approximately 400 million individuals will be impacted by water shortages, deaths from the rising intensity of heatwaves, as well as areas that have become virtually uninhabitable (Wells, 2019). As global temperatures rise to 3°C, southern Europe is predicted to experience prolonged-to-permanent drought and the Caribbean, as well as areas in Central America, will undergo extended periods of droughts possibly nineteen to twenty-one months longer (Wells, 2019). While these projections may seem like the work of science fiction, these projections provide us with an understanding of our potential future if we continue with a business as usual mentality. Accompanied with an increasingly warming planet, areas that were previously covered in permafrost will melt. This will release over a trillion tons of carbon into the atmosphere (Wells, 2019).

Can we move forward?

Is there a way in which humans can move forward, in terms of climate change? Questions such as this seems to arise when discussing mitigation efforts pertaining to climate change. Howlett, Ferreira, and Blomfield (2016) began answering this question by utilizing a quote from Einstein which stated that humanity's problems cannot, and should not, be rectified with the same thinking that was utilized in birthing it. In the year 2014, the Intergovernmental Panel on Climate Change (IPCC) informed the public in their fifth assessment report that climate change

will result in the dislocation of millions of people, generate failing crops, fuel civil unrest, and result in the loss of roughly trillions of dollars in the economy. With our grim future, the eerie question remains, *can we move forward?*

The ever-changing environment has resulted in the drive for an *interdisciplinary* effort in relation to the field of sustainability. Howlett, Ferreira, and Blomfield (2016) defines an interdisciplinary approach as including various ways of approaching a specific topic. In terms of moving forward, sustainability scientists advocate for the human species to live more sustainably which pertain to altering the ways in which we live to augment the likelihood of the environment as well as human society, health, opportunity, and ultimately security (McMichael, Butler, & Folke, 2003). While the need for sustainability may be repeatedly stressed, Freeth and Caniglia (2019) indicates that the interdisciplinary approach to sustainability is not effectively taken into consideration when partaking in interdisciplinary research. Freeth and Caniglia (2019) stress that various approaches to addressing climate change and sustainability are necessary, but researchers who partner with sustainability scientists' may not fully understand sustainability. By realizing this fact, the lack of knowledge in a particular field can create a space of understanding for individuals in that field of research, and possible new approaches for reaching researches in that field.

Problem Statement

While the understanding of climate change and sustainability is an issue that is stressed, there appears to be a lack of understanding amongst those who are not in the field (Freeth & Caniglia, 2019). While interdisciplinary is a quality that is stressed in the field of sustainability, Freeth and Caniglia (2019) indicated that there is a belief that amongst senior and junior researchers recruited, they will already possess the full range of skills and knowledge required in

order to collaborate. Many researchers consider themselves scholars who cross disciplinary lines; however, interdisciplinary approach should not only consist of academics who are knowledgeable about a specific topic but should also consist of individuals who possess the ability to contribute skills that foster a cohesive learning atmosphere (Freeth & Caniglia, 2019)

Moreover, social and spatial dimensions must be included within the interdisciplinary approach to the field of sustainability research (Freeth & Caniglia, 2019). This approach is useful in the dissemination of knowledge pertaining to the understanding of climate change and sustainability research. Taking the concept of social and spatial dimensions into consideration, interdisciplinary research must also factor in the general public as stakeholders seeing as the general public also has access to read their research. In light of these factors, attention must also be given to millennials beliefs and perceptions about climate change and sustainability research to determine the extent to which they understand the data. The general problem is that some millennials who have a higher education background in a non-scientific field appear to possess a lack of understanding pertaining to climate change and sustainability. The specific problem is that the extent of the lack of understanding which can create a disconnection between the social and spatial dimensions is not known within millennials who have a higher education.

Purpose of the Study

As stakeholders in the pursuit to understand climate change and sustainability research data in order to address mitigation efforts in our changing environment, confusion about scientific data and technical terminology can be a challenge to comprehend (Wells, 2019). The purpose of this qualitative explanatory multi-case study is to examine the beliefs and perceptions pertaining to climate change and sustainability amongst millennials who have a higher education background. The area that will be explored is to determine the extent to which lack of

understanding between social and spatial dimensions within higher education millennials impact their understanding of climate change and sustainability.

Significance

Research in climate change and sustainability highlights the importance of not only understanding the complexity of climate change research from the platform of statistical data, but also understanding the effects of climate change on humans from a phenomenological perspective (Figgener, 2015; Freeth & Caniglia, 2019; Wells, 2019). Freeth and Caniglia (2019), Veil, Buehner, and Palenchar (2011), and Wells (2019) pointed out the importance of interdisciplinary collaboration to knowledge and the importance of being able to connect the data to real life experiences through social media. This approach takes into consideration the ability to understand the scientific data on climate change through spatial and social dimensions by exercising the utilization of virtual space (Veil, Buehner, & Palenchar, 2011). Based on this approach, this qualitative multi-case study is significant to not only researchers within the climate and sustainability science discipline, but also to other stakeholders such as celebrities, artists, educators, and universities in order to address the interdisciplinary approach to understanding climate change and sustainability (Freeth & Caniglia, 2019). Information gleaned from this study may assist in bridging the gap between climate and sustainability scientists and the larger public by calling attention to integrating people and their experiences into the discussion of climate change and sustainability, as well as integrating various areas of study into climate and sustainability science.

Chapter 2

Literature Review

In recent years, anthropogenic activity resulted in the unprecedented warming of the planet (Wells, 2019). This drastic warming has drastic impacts on large portions of the world's populations (Finan, 2009). While there are still many individuals who are skeptical of climate change or reject the validity of it, climate change was infused into the public (Finan, 2009). In doing so, awareness about environmental sustainability increases. Environmental sustainability awareness can, in turn, mend behavior as well as choices that are made in economic self-interest (Hamid, Ijab, Sulaiman, Anwar, & Norman, 2016).

Earth Beyond 2°C

Fear and Fearmongering. Reports from 2005 projected global temperatures would rise between 1.4 and 5.8°C by the end of the century (Patz, Campbell-Lendrum, Holloway, & Foley, 2005). Coupled with this data, are increasing research geared towards analyzing how climate change will impact human health. Changes in the Earth's climate will result in a worsening of human health due to a combination of heat related deaths, infectious disease, droughts and storms, and altered air and water quality (Patz, Campbell-Lendrum, Holloway, & Foley, 2005) Record-breaking rising temperatures are already being experienced. The National Oceanic and Atmospheric Administration (NOAA) reported that July of 2019 was the hottest July in their 140-year record (NOAA, 2019). These increased temperatures aided in diminishing Arctic as well as Antarctic sea ice to historic lows (NOAA, 2019). NOAA (2019) reported that the loss of Arctic sea ice in July of 2019 surpassed the preceding historic low from July of 2012 by approximately 20%.

Variations in the Earth's climate and weather events are affecting infectious disease agents such as bacteria and viruses as well as vector organisms such as mosquitos and ticks (Patz, Campbell-Lendrum, Holloway, & Foley, 2005). Variations in the Earth's climate has profound effects on the spread of vector-borne and food-borne diseases such as mosquitoes that carry the dengue fever and the increasing the incidence of food-borne infections with pathogens such as salmonella (Patz, Campbell-Lendrum, Holloway, & Foley, 2005). While infectious diseases such as these are being studied, there are additional diseases that are expected to be revived if the Earth continues to warm.

Entombed within the Arctic ice and permafrost are infectious agents that the human immune system is not exposed to (Wells, 2019). Due to being entombed, the human immune system does not yet have a way to defend itself if such diseases are released. Such disease agents and potential vectors are being extracted and studied by scientists (Wells, 2019). According to Wells (2019), vectors and disease agents such as 32,000-year-old bacteria and a 42,000-year-old worm were revitalized in 2005 and 2018 respectively in order to be studied. While they are currently being studied to understand potential health effects, scientists are also concerned about disease mutations among current diseases as well as diseases that are not completely understood (Wells, 2019).

One such disease that is still relatively new is Lyme disease that is transmitted through ticks. While many Americans are grappling with ticks and Lyme disease, there are countries such as Korea, Japan, and Turkey where Lyme disease was nonexistent prior to 2010 (Wells, 2019). Since the infestation of Lyme disease, countries are now experiencing increased caseloads of individuals infected with this disease (Wells, 2019). However, Lyme disease is not exclusive to

humans. Due to ticks, scientists believe that by the end of the century the moose population in the state of Minnesota will become extinct.

Market Faith and the Economy. In the previous section, fear and fearmongering was presented by exploring the current risk of diseases and the driving factors for them. One disease that was introduced was food-borne vectors such as salmonella; while this is a vector that should be of great concern, there is another potential crisis that is looming. The implications of climate change on the agricultural sector are high because food systems are highly sensitive (Fanzo, Davis, McLaren, & Choufani, 2018). Agriculture, nutrition, as well as climate change are all interconnected (Fanzo, Davis, McLaren, & Choufani, 2018). The effects of climate change on the agricultural sector and fisheries will have a dramatic effect on the economy not only by the quality of the produce but also increasing prices on consumers (Fanzo, Davis, McLaren, & Choufani, 2018). Climate change is anticipated to decrease the overall nutritional content of produce and the shipment of produce because of decreasing soil qualities and rendering certain transportation routes challenging due to damaged infrastructure (Fanzo, Davis, McLaren & Choufani, 2018).

The magnitude of economic destruction that will result from the changing climate is alarming when analyzed by country (Wells, 2019). Northern countries such as Greenland and Canada are expected to experience agricultural improvement as well as an improvement in economic productivity. Conversely, countries such as the United States and China – which account for a majority of the global economic activity – will experience a loss of approximately half of their output (Wells, 2019). Whereas countries located closer to the equator such as Mexico and India will ultimately experience agricultural and economic losses at nearly 100% (Wells, 2019).

Projections from a report issued by the World Bank in 2018 estimated that current carbon emissions trend will result in the destruction of roughly 800 million individuals residing in Southeast Asia. Correspondingly, roughly 100 million individuals will be cast into extreme poverty within the next decade (Wells, 2019). Wells (2019) compares climate change to previous economic downfalls in the United States by stating that climate change will not result in a Great Recession nor will it result in a Great Depression, but rather a Great Dying.

An underlying factor of these drastic economic changes is due to the fact that environmental catastrophes are expensive to respond to and that human infrastructure was not constructed to withstand such climactic changes (Wells, 2019). In 2018 it was estimated that roughly 2.4 American homes and businesses will experience persistent flooding by 2100, and in the upcoming few decades it is expected that the impact on real estate in New Jersey will be roughly \$30 billion (Wells, 2019). With Earth warmed by 1°C, humanity will witness a 0.88% decline in American gross domestic product (GDP) whereas global GDP will drop 0.12%. An Earth that has warmed by 2°C will experience a tripling effect in terms of climatic changes (Wells, 2019).

Skepticism and Debates. In the past century, environmentalists began to understand and explain how anthropogenic actions resulted in climate change. A general consensus declares that climate change is occurring. Despite this, there are still those who disavow environmental data which shows that anthropogenic activity has in fact effected the earth and its climate (Lewandowaky, Cook, & Lloyd, 2018). According to Stenhouse, Myers, Vraga, Kotcher, Beall, and Maibach (2018), ideological and political rifts which typically fuels conflict on subjects of scientific facts. It is believed that certain individuals value market and business and believe that increased environmental regulation will decrease or limit businesses and the market (Stenhouse,

Myers, Vraga, Kotcher, Beall, & Maibach, 2018). By intertwining the acceptance of climate change with increased environmental regulations and a declining market, it is believed that individuals will reject the occurrence of climate change (Stenhouse, Myers, Vraga, Kotcher, Beall, & Maibach, 2018). Approximately 20% of Americans believe that climate change is a ploy conceived by scientist who want to waste taxpayer money on climate research (Lewandowsky, Cook, & Lloyd, 2018).

Additionally, Lewandowsky, Cook, and Lloyd (2018) attribute the lack of belief and trust in environmental data to the *climategate* event which took place in 2009. During the *climategate* event, the private emails of many scientists were hacked and uploaded onto the internet. This event was construed by many as evidence that climate change is a hoax, further adding to climate skepticism (Lewandowsky, Cook, and Lloyd, 2018). While many placed stock in these stolen emails, independent investigations occurred which ultimately found that the released emails did not hold scientific merit (Lewandowsky, Cook, and Lloyd, 2018).

In addition to *climategate*, many individuals also posit that single extreme events are not related to, nor is it evident for, climate change (Lewandowsky, Cook, and Lloyd, 2018). In order to validate their claims, while also contradicting themselves, they cite colder temperatures as evidence against climate change. One infamous case where an individual referred to colder temperatures as evidence contradicting climate change, is Senator James Inhofe bringing a snowball to the Senate in order to dispute global warming (Lewandowsky, Cook, and Lloyd, 2018).

While consensus is continuously growing in terms of the validity of climate change, many Americans identify climate change as a distant issue that will not present itself in their lifetime (Hmielowski, Feldman, Myers, Leiserowitz, Maibach, 2014). As a result of perceiving

climate change in this light, action on climate change is not forthcoming due to the low priority accorded to it (Hmielowski, Feldman, Myers, Leiserowitz, Maibach, 2014). This is vital because climate change is also viewed as a partisan issue (Lucas, 2018). While new scientific assessments, findings, and extreme weather events have continuously been generated, Wells (2019) stated that many within the public have responded as though the scientific community has constantly cried wolf.

Space. While damages that occur from climate change are increasingly occurring, coverage as well as attention to these damages are rarely in our active mind-space (Wells, 2019). Wells (2019) identifies popular movies and series that display a devastating climate link occurrence ranging from Game of Thrones famous phrase “Winter is Coming” to Interstellar; series and movies such as these are chosen in order to convey how willing the public is to watch them for entertainment purposes, yet choose to negate real-world climate occurrences. Such movies and series depict a fictional apocalyptic world that some so eagerly consume as an illusory story that may never happen, but how will people react when the Earth warms beyond 1°C and such illusory depictions become tangible (Wells, 2019)?

Many movies that are inclusive of climatic changes include a villain that is simple to identify as the birther of the issue (Wells, 2019). In this sense, if an issue were to emerge it would be simple to identify the perpetrator (Wells, 2019). In terms of climate change, who can be identified as the perpetrator? Who can be identified as the victim? While we continuously secrete greenhouse gas emissions throughout our daily lives in the industrialized world, we become both the perpetrator and the victim. As indicated by Wells (2019), in terms of climate change humanity cannot live outside of climate change.

Social Media Awareness in Environmental Science

In the few decades in which the internet has been commercialized, society has transformed the way in which information is gathered (Firth, Torous, Stubbs, Firth, Steiner, Smith, et al., 2019). The utilization of social media is deemed useful for the dissemination of information because of its growing popularity (Hamid, Ijab, Sulaiman, Anwar, & Norman, 2016). While environmental scientists realize the potential of utilizing such networking spaces, the act of utilizing social media for disseminating information and raising awareness is not widely understood. According to Andersson and Öhman (2017), the utilization of social media as a virtual space amongst the younger population is steadily increasing. With the increasing use of social media, Andersson and Öhman (2017) expressed that understanding how important issues are conceived and given meaning to is relevant particularly in relation to the environment and sustainability. When young individuals partake in discussions while occupying virtual space, education and the conception of important issues can take place (Andersson & Öhman, 2017).

Understanding how environmental knowledge is disseminated through virtual space is an important space to explore. Particularly because a majority of young adults indicate that they are almost always online. This is important to consider because of the fact that upcoming generations are being born into an online society, with roughly 95% of American teens reportedly possessing a smartphone (Firth et al., 2019). However, while there are studies that explore how social media politicizes the issue, there are minimal analysis which explores how social media can affect environmental awareness. This creates a disconnection between the scientific community and millennials where factual information pertaining to climate change and sustainability can be disseminated. Velasquez and LaRose (2015) explored online political participation as well as activism through the utilization of social media sites such as Facebook

and Twitter as a comparative analysis in relation to physical political activism. The study focused on comparing political activism perspectives in relation to virtual space or in person (Velasquez & LaRose, 2015). It is apparent that there are many studies that focus on online political activism; whereas, online environmental activism and understanding among younger individuals through an interdisciplinary approach is seemingly lacking.

Shifting to an Interdisciplinary Approach. According to Freeth and Caniglia (2019), knowledge in terms of environmental issues, particularly in relation to sustainability, is best generated and disseminated through the utilization of an interdisciplinary approach. However, collaboration across disciplines is apparently lacking (Freeth & Caniglia, 2019). Sibbel (2009) indicated that many environmentalists have emphasized that change should occur through shifting the behavior of consumers. Despite this emphasis, Sibbel (2009) stated that there has not been substantial progress towards this movement on a global scale. In order to address this lack of motivation, Sibbel (2009) indicated that there are many barriers to sustainability, one of which involves education.

It is possible to shift consumer behavior through education. Education can take many forms through disseminating information. Crate and Nuttall (2009) indicated that the portrayal of climate in media is significant for understanding how climate change is not only defined but also comprehended and validated. Through the media as well as the virtual media, is it possible for individuals to understand how the lack of environmental actions can have a negative financial impact on the environment? The lack of such environmental actions can result in a financial impact of an approximate \$26 trillion-dollar deficit within the next decade (Wells, 2019). Disseminating information to educate the public must be inclusive of multiple disciplines. This is critical because environmental events that occur in the near future will be a result of our actions

or lack of action (Wells, 2019). Although there is current literature that examines climate change and sustainability, there is a lack of literature that examines millennials climate change and sustainability perspectives.

Chapter 3

Methodology

There are various types of qualitative studies that researchers can partake in, such as a phenomenological study, an ethnographic study, grounded theory, case studies, and narratives. A phenomenological study emphasizes how experiences of individuals shape their consciousness (Merriam & Tisdell, 2016). In other words, phenomenology pertains to an individual's experiences in life as well as their social actions. In addition to phenomenology, ethnographic research is possibly the most widely known form of qualitative research in that it focuses on culture as well as society; however, the term culture is a very broad term. Culture is defined as the shared values, beliefs, and attitudes between a specific population (Merriam & Tisdell, 2016). Grounded theory is differentiated from the various other forms of research in that it focuses on building theory from the qualitative study. Whereas case studies are defined as exploring units that are within a bounded system. According to Merriam and Tisdell (2016), a bounded system is defined as a unit that exists within an enclosed system. A case study can take the form of a single case with one individual (or one site) or a multi-case with multiple individuals (or multiple sites). Lastly, narratives pertain to first-person stories that are told in order to better understand human experiences (Merriam & Tisdell, 2016).

For this qualitative study, utilizing a multi-case approach is appropriate because it provides the opportunity to explore millennials' beliefs and perceptions in two sites. A phenomenological approach is integrated with a case study approach because this qualitative study focuses on participants' beliefs and perspectives that have been shaped through their daily experiences and social actions. Adger, Barnett, Brown, Marshall, and O'Brien (2013) highlighted that understanding climate change from an anthropological perspective is essential because

individuals understand climate change through their lived experiences as well as which translates into their consciousness via the space around them.

Appropriate Design

For this qualitative study, a quantitative methodology is not utilized because a quantitative methodology employs variables that analyzes cause and effect interactions through the utilization of numeric data. Utilizing a quantitative approach does not provide the opportunity for the researcher to explore and explain *why* and *how* participants perceive a phenomenon the way that they do. In addition, a quantitative approach does not provide the opportunity to describe participants beliefs and perceptions on a particular topic. Conversely, a qualitative case study is appropriate in order to explore and explain participants beliefs and perception through the use of focus groups. This approach provides an in-depth and descriptive data within an enclosed system (Merriam & Tisdell, 2016). For this study, the enclosed system is millennials who are seeking a higher education from two universities in northern New Jersey.

Data Collection

According to Merriam and Tisdell (2016), qualitative data is defined as in-depth descriptive information that can be obtained from participants. Information obtained through words is considered qualitative data. Qualitative data can be obtained from interviews, thorough accounts of individuals beliefs and perceptions (Merriam & Tisdell, 2016). Qualitative data can also be obtained through observations based on individuals actions or through collected documentation such as artifacts or archival data (Merriam & Tisdell, 2016). For the purpose of this research, data was collected through semi-structured focus group interviews.

Qualitative interviews can be conducted in three ways such as structured, semi-structured, and unstructured interviews (Merriam & Tisdell, 2016). This particular research will

focus on semi-structured interview questions. Semi-structured interviews are considered as the midpoint of structured and unstructured interviews. In that, there is information that is desired or central to the interview, but the questions that will be asked are open-ended. Additionally, the interviewer is guided by a list of open-ended questions based on the research topic (Merriam & Tisdell, 2016). According to Merriam and Tisdell (2016), a principal variance between focus groups and various forms of research is that focus groups occur in a group setting. Focus groups are able to highlight a group discussion in which collaborative discussions occur. This is essential because in a group discussion, participants are able to not only share their perspective on particular topics, but also hear the perspective of other participants and possibly elaborate on their own perspectives (Merriam & Tisdell, 2016).

Focus Group Interviews

Semi-structured interviews assisted in exploring the beliefs and perceptions of millennials pertaining to climate change and sustainability. Five university students from two universities, each, participated in approximately a 75-minute semi-structured interview that was recorded with the students consent. Audio-recording is perhaps the most common method of documenting an interview (Merriam & Tisdell, 2016). This is beneficial in ensuring that an accurate transcription of participants responses is transcribed (Merriam & Tisdell, 2016).

Sample Population

Quantitative research typically utilizes random sampling in order to generalize research findings to the larger population. In comparison, qualitative research can utilize purposeful sampling in order to obtain in-depth data necessary to answer research questions (Merriam & Tisdell, 2016). According to Merriam & Tisdell (2016), there is no rule that identifies a number of participants needed for a case study. For qualitative research, the deciding factor depends on

the questions that are being asked in order to obtain in-depth data with the purpose of answering the research questions.

For the current explanatory multi-case study, the sample population consisted of a purposeful sample of millennials who are knowledgeable about the research topic. The study included two focus groups. Five students were chosen from two universities which resulted in a total of ten students. These students were selected based on two characteristics; they must be between the ages of 18-28 and cannot have a major in environmental science. Participants who met the criteria for the research study were invited to participate in the study.

Geographic Location

The research sites that were utilized are two universities located in northern New Jersey. Site one offers fifty-three undergraduate degree programs that students can select as their major, twenty-four master's degree programs, as well as two doctoral programs (William Paterson University, 2017). Among the fifty-three undergraduate degree programs, site one offers various degree programs within their College of Humanities and Social Science program. Within this college, students are able to declare a major or minor from forty-three different programs ranging from Accounting and Law, Anthropology, Africana-World Studies, to Environmental Science, Geography & Urban Science, Psychology, and Women's & Gender Studies (William Paterson University, 2017).

Site two offers three hundred-degree programs in which students can select as either their major, minor, or certificate program (Montclair State University, 2019). Similar to site one, site two also offers various degrees within their College of Humanities and Social Sciences program. Within this college, site two offers twenty-four programs in which students can major in and forty-nine programs in which students can minor in. These programs range from anthropology,

history, justice studies, and political science, to environmental justice, criminal justice, international studies, pre-law studies, and social work (Montclair State University, 2019).

Recruitment and Informed Consent

As the primary instrument for the collection of data, it is imperative to be ethical (Merriam & Tisdell, 2016). In order to remain ethical and impartial, with IRB approval, a flyer was displayed within the Anthropology department that describes the nature of the study. I sought five to eight students who are non-environmental science majors and between the ages of 18 to 28, to discuss the subjects of climate change and sustainability. Additionally, the Anthropology department sent students within their department a copy of my email-invite as an added method of recruitment. Lastly, an in-person invite was made in order to recruit students as well as answer any potential questions related to the study.

Prior to the start of the focus group, participants were informed about the nature of the study and that the interview will take approximately one hour and fifteen minutes. The participants were then given a consent form that they were asked to read. Participants were informed about the benefits of the study, that there are no anticipated risks, and since participation in the study is voluntary participants have the right to withdraw at any time. Following this information, participants were asked to sign the consent form only if they agreed to participate in the study.

Confidentiality and Data Storage

Ensuring the confidentiality of participants and participant data is essential for research studies, in terms of ethical consideration (Merriam & Tisdell, 2016). Consequently, in order to ensure as well as maintain privacy, security, and confidentiality during as well as after the completion of the research study, files were stored on a password protected flash-drive. Each

participant was given a pseudonym in order to conceal their responses. Once the interviews were transcribed, the audio files were deleted, and the transcription was stored on the password protected flash-drive. All collected data, such as consent forms, were scanned and stored separately from the collected data and uploaded onto the password protected flash-drive, and the original copy will be destroyed. Lastly, any emails from participants were deleted as soon as the data has been collected.

Data Analysis

According to Merriam and Tisdell (2016), the primary purpose of data analysis is to uncover themes that can answer research questions. The general procedure of qualitative data analysis begins by finding regularities in the data that answers the research question (Merriam & Tisdell, 2016). In order to analyze the data, the data must be categorized. Saldaña (2016) highlighted the importance of developing coding categories in order to organize interview data. For my research study, transcribed focus group interviews and field notes were imported into NVivo 12 Pro where they were organized and coded.

Coding

In order to ensure the accuracy of the transcribed interviews, the audio recordings were reviewed multiple times. Following the review of the transcripts, a form of open coding was utilized because of the fact that (at this initial stage) I was open to all possible codes (Merriam & Tisdell, 2016). By assigning codes to the data, categories were constructed, and the number of categories utilized depended on the nature of the research (Merriam & Tisdell, 2016). According to Saldaña (2016), depending on the researcher and the goals of their study, a single coding method may not be sufficient. In fact, two or more coding methods may need to be employed in order to grasp the complexity of the data.

For my research study, three coding methods were employed. Following the review of the transcripts, open coding was the first method utilized. Saldaña (2016) indicated that open coding analyzes and collapses qualitative data into separate parts in order to closely analyze and compare them. Open coding is useful in creating a beginning stage for a researcher to explore the direction that they will find themselves in for their study (Saldaña, 2016). Open coding was used in order to develop categories from transcribed data. Emotions are considered to be a universal experience which seemingly influences perceptions as well as decision-making (Saldana, 2016). Following the initial stage of open coding, emotion coding was utilized. The utilization of emotion coding assists in analyzing and categorizing participants experiences, actions, decision-making, reasoning, as well as perspectives particularly in questions that explore participants feelings on certain topics (Saldaña, 2016). Finally, axial coding was utilized to reorganize and refine categorized data in order to unearth patterns and commonalities. (Saldaña, 2016). This coding process was utilized in order to unearth developing themes.

I used the NVivo 12 Pro computer software in order to import focus group interview transcripts, organize, and code data. I also utilized the NVivo 12 Pro software for the purposes of engaging in data identification, code assignments, the manipulation of data, as well as identification of themes. This is an appropriate data analysis approach in order to describe the beliefs and perceptions of millennials on the subject of climate change and sustainability.

Research Questions

The purpose of this qualitative explanatory multi-case study is to collect in-depth data that explores and explains the beliefs and perceptions of millennials pertaining to climate change and sustainability. The following four research questions are utilized in order to guide the collection of data:

RQ1: What do millennials know and perceive about climate change and sustainability?

RQ2: What strategies do millennials use in order to address sustainability?

RQ3: How do millennials define sustainability and climate change?

RQ4: What do millennials believe their roles are within the scope of climate change and sustainability?

Chapter 4

Analysis and Results

The purpose of this qualitative explanatory multi-case study was to explore millennials beliefs and perceptions pertaining to climate change and sustainability. The general problem is that a number of millennials who possess a higher education background in a non-environmental field appear to lack of understanding pertaining to climate change and sustainability. The specific problem is that the extent to which millennials understand the difference between the social and spatial dimensions is not known amongst millennials who have a higher education.

This qualitative explanatory multi-case study concentrated on answering questions pertaining to *how* as well as *what*. *How* questions pertained to how millennials define sustainability and climate change; whereas *what* pertained to what millennials beliefs and perceptions are in relation to climate change and sustainability, as well as what strategies millennials implement in order to address sustainability. 14 undergraduate students from two universities in Northern New Jersey participated in my research study. The following research questions were utilized in order to explore their responses:

RQ1: What do millennials know and perceive about climate change and sustainability?

RQ2: What strategies do millennials use in order to address sustainability?

RQ3: How do millennials define sustainability and climate change?

RQ4: What do millennials believe their roles are within the scope of climate change and sustainability?

Data collection comprised of two focus groups and my research followed the protocol delineated in Chapter 3. Chapter 4 will present results and findings. Tables and figures are

utilized in order to display the results of the research findings. Chapter 4 also consists of emerging themes derived from analysis of data.

Data Collection

A purposeful sample of millennials was utilized for this qualitative explanatory multi-case study. Undergraduate students were presented with an informed consent form which was inclusive of the purpose of the qualitative explanatory multi-case study, a confidentiality agreement, the length of the focus group, as well as the fact that participation is voluntary. Each department within the universities provided access to students enrolled in courses, and no department or participant withdrew from this qualitative explanatory multi-case study. Each university department aided in the recruitment process by disseminating flyers for the research study to students and informing them of the opportunity to participate in my research study.

Population and Criteria

Participants were comprised of seven undergraduate students each from two universities for a total of 14 students in northern New Jersey. Participants were required to meet two requirements: (a) participants must be between the ages of 18-28; and (b) participants must be non-environmental science majors. Participants were not provided with the interview questions prior to the scheduled recruitment date for the qualitative explanatory multi-case study. This provided for the opportunity to have an open semi-structured discussion about the research questions. Demographic data collected was limited to participants educational background. Table 1 illustrates the participants various majors.

Table 1

Participants major

Major	Number of participants sharing major
Psychology	3
Anthropology	2
Biology	2
BioChemistry	2
Chemistry	2
Studio Art	1
Computer Science	1
Athletic Training	1

Data Collection and Analysis Overview

My data collection method consisted of two focus groups. Data collection followed the procedures delineated in Chapter 3. Authorization for this research study was attained through the Internal Review Board (IRB). Participants signed informed consent prior to data collection. A field test was conducted in order to gain feedback on the framing of focus group questions, which provided valuable feedback in rephrasing some of the wording. However, while some questions were reworded, the essence of the questions remained unchanged. Following the rephrasing of the interview questions, semi-structured focus group interviews commenced. Focus group interviews were audio-recorded to ensure accuracy for transcription purposes. Data collection was also inclusive of field notes, which were used to record personal thoughts and observations that are difficult to capture through audio recordings.

Transcribed interviews were imported into NVivo 12 Pro in order to organize data and assign codes. Data analysis entailed open coding to develop categories and regularities from the imported transcription. In addition, emotion coding was utilized in order to uncover actions and experiences that guide their decisions, as well as explore the participants feelings on the given topics. Lastly, axial coding was utilized in order to collapse and regroup regularities that were previously observed. Strings of quotes that described emerging themes were generated, and themes were allocated. Concept maps directed the progression of emerging themes. In order to refine the emerging themes in relation to millennials beliefs and perceptions of climate change and sustainability, re-analysis of the data occurred.

Emerging Themes

The analysis of the data resulted in four themes which were developed through the three hierarchical categories of awareness-action and emotion, events and imagery, and information. These categories were developed based on participants coded responses. The four significant themes that emerged from these hierarchical categories are: (a) knowledge and understanding; (b) generations and responsibility; (c) awareness, political power, and purchasing power; and (c) affect and importance.

Theme 1: Knowledge and Understanding

The first analytical theme that emerged pertained to millennials general sense of information pertaining to their knowledge and understanding of climate change. The objective of RQ 1 was to explore how millennials define climate change as well as sustainability. Participants were asked what they perceived when they heard the term *sustainability*. Marcus from WPU stated that he considers sustainability to be inclusive of monitoring as well as understanding what

the “human race” emits in terms of energy and pollution, as well as what we consume. Danielle stated that she perceives sustainability in terms of society being more responsible. Danielle continued to state

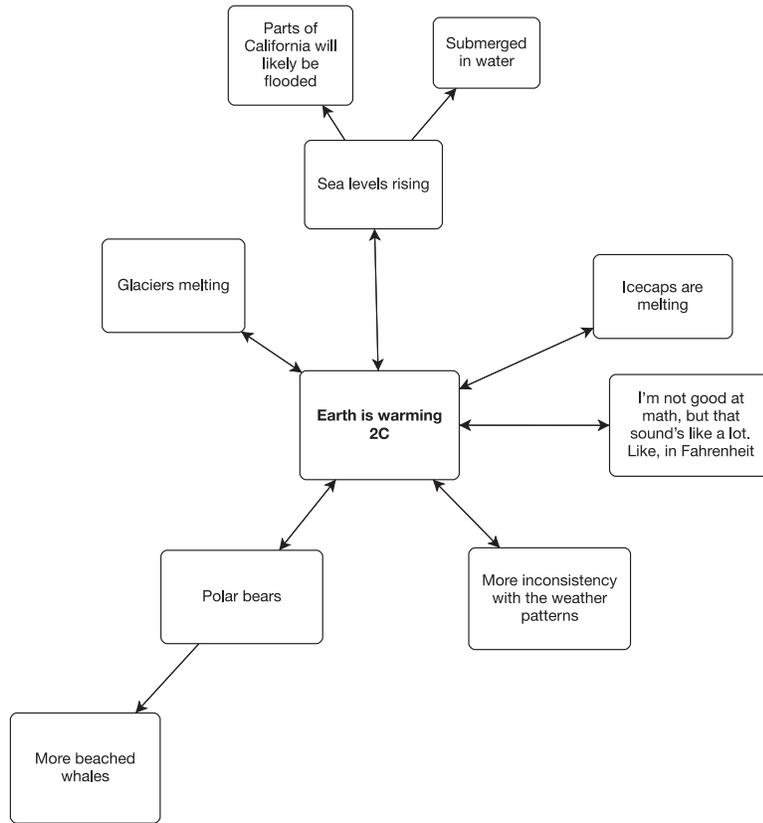
It’s literally our home...so...to be so irresponsible and to like throw things out that can be recycled or to just...litter or contribute to global warming and stuff like that...I just...it like confuses me why people decide to treat the planet so badly.

To which Katherine responded, “Cuz people only care about themselves, and how they’re living right now.” Participants at MSU indicated that they associate positive “stable”, “constant”, “balance”, “straightforward”, and “crazy high-tech...zero carbonated emissions” to the word *sustainability*. However, when participants were asked what they perceived when they heard the term *climate change*, their associations were negative such as “we’re screwed”, “unstable”, “downfall”, and “shattered”.

In addition to their associations to *climate change* and *sustainability*, participants were also asked what they understood by the statement “the Earth is warming by 2°C”. Participants’ responses can be seen below in Figure 1. Participants generally responded by referencing occurrences that have and will take place such as the melting of glaciers and icecaps and sea levels rising. In addition to their awareness of some events that will take place with the increased warming of the Earth’s climate, the uncertainty of converting Celsius to Fahrenheit was also present. Though this uncertainty pertaining to how to convert Celsius to Fahrenheit was present, there was basic awareness of the negative outcomes associated with climate change.

Figure 1

“The Earth is warming by 2°C”, what does that mean to you?

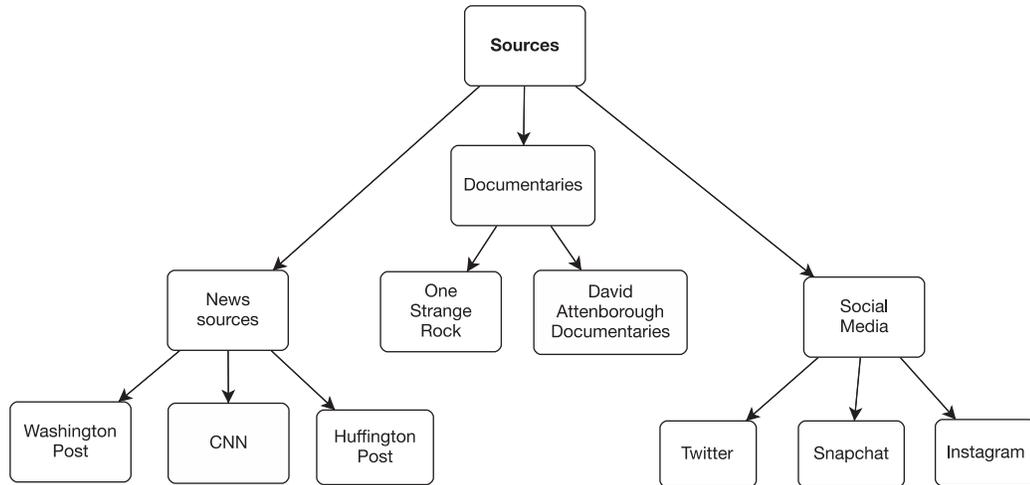


In order to understand how millennials define climate change and sustainability, I explored the sources that millennials utilize in order to attain information pertaining to climate change and sustainability. Figure 2 illustrates the various sources that participants from both universities typically utilize in order to attain their information pertaining to climate change and sustainability. What is interesting, but not surprising, to point out is the fact that journal articles were not identified as a source that is typically utilized. Simon from MSU stated that he has “read a few papers” because it was required for a specific class assignment. Connor from WPU

stated that he does not utilize social media; instead, he attains his information from: TV, conversing with friends, and from the homepage on an electronic device.

Figure 2

Sources that are typically utilized for information



When asked how participants attained their information pertaining to climate change, a majority of the participants indicated that their information is attained through social media, a few participants expanded on their initial social media response to state that they also utilized news sources, and one participant stated that he watched documentaries, which is illustrated in Figure 2. Diane from WPU, explained why she believed millennials preferred social media as a source of information. Diane stated

People our age our generation and younger, they like to go through things quickly. It's not like they like to read a whole paragraph. It's either like, watch a video that's two minutes or like wa...or like look at a picture. So like for it to be like on social media...like for me I think, I watch stories on snapchat and then like I've seen like news, and I go through it cuz it's quick and then they talk about and then they have like a short like paraphrase and then like that just gives me some knowledge. And then if you're like more interested you can obviously go online and look for it more but it...at least it's like

out there and you...it gives you like a sort of generalization and like it makes you more interested cuz it's quicker.

What needs to be address in this quote is how information that is viewed as being “short” is valued and is sought after amongst millennials in order to attain “information”. However, a question that should also be asked is what sources millennials are receiving information pertaining to key issues from. Utilizing Snapchat as Diane stated is in fact beneficial in sharing information, but what quality of information is being shared in a two-minute video and a picture that has a character limit? Social media’s omnipresence as a supply of information was reinforced by Marcus who stated that information will still reach individuals who are not on, or actively on, social media. However, Marcus pointed out that environmental news and/or information has to compete with other “news”. Some of which is less relevant. Marcus stated

You’ll still hear about it, no matter what. Even no matter how...less active you are on social media, or not how active you are on social media, that’s...like you...you’ll find out Kim Kardashian’s like left butt-cheek implant will explode, and you will hear about it tomorrow, no matter if you have social media or not. No, but in terms...when it comes to something really serious...you don’t really hear about it. I didn’t hear about the Amazon forest until 3 days after it happened. NOT EVEN, like maybe like less than a week after it happened. Because I, we are so caught up in our own lives...

One question that resonates from this quote is why celebrities such as Kim Kardashian are more likely to immediately “go viral” when compared to climate change information on social media. Should researchers focus on what pages millennials follow, or perhaps this is a broader issue? In which information that is less relevant to the overall health of society is constantly reinforced through retweets and reposts on social media by celebrities and non-celebrities that it overshadows climate change information. Though, events related to climate change do eventually surface. Participants at MSU and WPU

immediately referenced the Amazon Rainforest fire, given that when it was broadcasted on social media it immediately went viral. Questions pertaining to the Amazon Rainforest fire was posed to the group in relation to their initial reactions. Participants responded by using words such as “horror” and “scary”.

Simon from MSU relied on his knowledge acquired from documentaries that he’s watched in order to answer this question by stating

It’s the marginal barrier. That 2°C is the difference between sustaining the ecosystems that we understand and the ecosystem’s being forced to change because the climate is now too warm for them...um...I’ve watched enough documentaries to know that the difference that-that the animals and the ecosystems are very delicate, and that life in general is extremely delicate.

For Simon, watching documentaries aided in his ability to convey what “the Earth is warming by 2°C” meant to him. It is very likely that watching documentaries can aid in increasing one’s knowledge on key issues, but do millennials typically watch documentaries pertaining to climatic changes as a result of anthropogenic actions?

Theme 2: Generations and Responsibility

A second theme that emerged pertained to the hierarchical category of information. This theme can be linked to the previous theme of knowledge and understanding. The objective of RQ 4 was to explore what millennials know and perceive about climate change and sustainability. In order to understand what millennials know and perceive about climate change and sustainability, I built on the previous theme pertaining to their emotions to climate change and how important climate change and sustainability is in their perspective. Participants responded by explaining that they believed that society as a whole should share responsibility for the changing climate.

Participants explained that politicians and celebrities should be included in the discussion of climate change, and also explained that businesses and companies should also be held responsible in the discussion of climate change. Marcus from WPU stated that individuals can choose to be empathetic about certain issues, but we as a society should search for the larger contributing factor. This larger contributing factor is identified by Simon as being businesses as well as individuals by stating

Businesspeople aren't dumb. Right? If they realize that people aren't gonna buy a product, they're not gonna sell it. If they realize there's a new product, that everyone wants, they're gonna bring it into market. So, if we don't give...right? If we slowly work our way, farther and farther over eventually the businesses would follow us. Even if they don't want to. Even if the CEO of the business is like "climate change is fake." They're gonna follow because the money's going...

While, participants stated that there is a lack of care from society, Arianna from MSU stated

And like nobody realizes like how big this is of an issue until you actually see the statistics like in front of your face. Like everybody just thinks it's just a small problem, like they ignore it like it's nothing. Like, if everybody was reading this like...wow...like you don't even notice how much it's changed like all over the world. Like...yea, ok this was a hot October and people pass it by like "oh, it's warm for a little longer" like nobody realizes that it's affecting like not only us but like so many animals, plants, and...people everywhere.

Arianna continues by stating that she believes "there's always gonna be more selfish people" who believe that there are larger problems in the world to worry about other than climate change. However, she also pointed out that individuals who believe that there are larger issues to be concerned about are unaware of the fact that our world is "literally gonna end at the end of the day". Additionally, Arianna expressed concern that "our

world is ending”, and that she felt “stuck in this constant state of worry at the end of the day”.

Participants were also presented with data from NOAA and climatechange.gov and asked to express what they were feeling and thinking. Participants from WPU focused on the information from NOAA that was shorter when compared to data from climatechange.gov that was longer and included graphs. Whereas participants from MSU focused on all of the information that was presented to them. Emma from MSU stated

Does it really mean anything? Like if we don't actually like...I don't know like it's not...it doesn't really have importance to us we're either studying it or like we actually see it happening in real time. But if we just say, like present people with like facts and statistics and stuff like that, it's easier to just say like just be like “alright” and just turn the page over.

This quote is interesting in that it highlights the overarching disconnect between data and the public's understanding of it. Emma's statement of “turning the page over” speaks volumes in that it, perhaps, answers the question as to why millennials are drawn to the “climate news” of social media because it is short, easier to digest, and potentially answers Emma's question of *does it really mean anything*.

By addressing information, the dissemination of information was also addressed. Participants from WPU explained that information as well as change should also occur from “the top”. Marcus from WPU explained that he believed that individuals from the top, such as celebrities should assist in change occurring. In terms of musicians, Marcus vehemently stated “god, if only they helped...just a little bit”. Comparisons to the dissemination of information in terms of climate change was made to the rapper Cardi b

and her interview with presidential candidate Bernie Sanders. Marcus also explained that he believed that conversations addressing climate change and sustainability should be inclusive of politicians, musicians, artists, celebrities, and scientists. What was interesting about this aspect of the discussion, was that Connor also began to generate ideas as to how the information could be disseminated. Does this plea to these various groups to disseminate information lend itself to a generational divide? In that millennials look towards celebrities on social media to disseminate information to numerous individuals.

However, while participants were highly engaged in these discussions and explained that this was their “first real discussion about climate change”, they also expressed their hesitance about moving forward and actively participating in climate change. Marcus stated, “I’m pretty much a hypocrite. I mean I can talk about it all day, but I’m not doing anything actively to do it... there’s only so much that I can do...”. While Marcus stated that he’s not actively participating in addressing climate change, he also explained that he was willing to participate in more conversations pertaining to climate change and sustainability. In fact, all 14 participants stated that they were willing to participate in discussions surrounding these topics.

When asked how their views have changed, given that these topics have become more central in the public discourse, many participants explained that their views haven’t changed as much because they did not believe that climate change is a topic that should be ignored. What has changed, is their level of awareness. Connor from WPU stated

I don’t think it’s changed because I think more than anything it’s just the awareness is coming about. Um, I’ve always been like ‘we need to do something about it’, it’s just becoming more prevalent

that we need to do something sooner than later, but it's just motivating me more to try and figure out how I can do my two-cents or whatever.

Chad reinforced Connor's statement by stating

My views really haven't changed much because I never really thought it was something unimportant or...um...not problematic... it's just a matter of well, once I...am capable, once I have a good job and have enough income like that's when I can really probably start making more of an impact uh commercially at least, cuz I can... cuz I can put my money where uhh I believe it should go as to more sustainable companies, but...my views haven't changed much.

While some millennials may not be continuously active in "combating" climate change, they are still aware of how important addressing climate change is. What should also be addressed is the belief that having a plethora of money is the only way in which change can occur. While money certainly makes a difference in terms of innovations, there are many ways in which change can occur with the funds that the average person currently has. These changes can pertain to reducing the amount of meat that one consumes, increasing the amount of vegetables one consumes, utilizing reusable items such as reusable shopping bags and travel mugs, consuming less energy by utilizing portable charges and unplugging home appliances that are not being used, carpooling, thrift shopping etc.

Theme 3: Awareness, Political Power, and Purchasing Power

Another analytical themes that emerged from the hierarchical category of awareness-action and emotion, was awareness, political power, and purchasing power. The objective of RQ 3 was to explore what millennials believed their roles are in addressing climate change and sustainability. This theme emerged based on participants' responses from both universities. All participants from both universities were aware of the need to address climate change and

sustainability. Two actions that were suggested and stated in terms of addressing climate change and sustainability were voting and purchasing power. When participants were asked what they believed their roles were in relation to climate change and sustainability, Marcus from WPU stated

My role personally is being able to vote because I sure as hell cannot be an activist, I care enough, but don't care enough... to be an activist because...hey, there are people who can risk their lives to be an activist. Unfortunately, I'm not one of those people...

Marcus continued to state that his role is not a personal priority for him.

Me personally...I wish it could be a priority, but ima leave here after today, and I'm still gunna go home, play PS4, and forget about it. Until I hear about it on Twitter. So, I can sit here and talk about it all the time, but I'm not gunna lie to you. I will forget about it, until it gets bad again. And then I'll be like 'oh shit, I should probably' you know, be more active in this conversation. But, the only thing I can do is vote in our local government, get the right people into office...

Questions that emerge from these two quotes pertain to the perception of activism and the scale of climate change. Why was activism placed on a two-way scale of "risking lives" or doing nothing perceived the way to address climate change? In viewing activism through a lens such as this, statements such as "I care enough, but don't care enough" are likely to emerge. Intertwined with this scale is a sense of disconnection, in which Marcus explained that he wishes that climate change is a priority for him, but it's not. So much so that he emerges himself in the virtual reality of videogames which assists him in forgetting about the global phenomenon of climate change. What is also interesting to point out is that Marcus explained that while he continuously distances himself from the issue, he is still occasionally exposed to information pertaining to climate change on social media when it gets "bad again". But what characteristic of climate change do

millennials define as getting “bad again”? In addition to Marcus distancing himself virtually, there is also a sense of political power in which he values and utilizes. In that, while he doesn’t view himself as an activist, he chooses to vote in order to create change.

While Marcus personally believed that his role in climate change and sustainability discussions pertained to voting, Katherine believed that voting did not pertain to her roles as much. Katherine stated

There’s a lot of pressure in voting. Because what if you’re not voting right in what you want to...if that makes sense? Right, so I typically stay away from voting which is kind of bad, but um, just staying informed and doing my part like a lot of stuff and stuff like that, I feel is good enough for me right now.

While participants at WPU appeared to be divided on their role within the scope of climate change and sustainability, participants at MSU appeared to be uniform in what they believed their role to be. In that, it appeared as though all participants believed their roles pertained to their purchasing power. Participants explained that they believed their roles followed their current actions in purchasing reusable items.

Theme 4: Affect and Importance

The objective of RQ 4 was to explore what strategies millennials utilize in order to address sustainability. Participants referred to actions that they take in terms of water conservation, recycling, purchasing power, and travel. Actions in reference to water pertained to spending less time in the shower and turning off the water when participants brushed their teeth. Participants’ purchasing power referred to the ability to purchase reusable water bottles and tote bags. Lastly, participants from MSU indicated that they make every attempt to walk to their destinations or take public transportations.

Participants also addressed climate change in reference to RQ4. Lana from MSU stated that she felt guilty because she felt as though she doesn't do "enough to save the...climate".

Chad from WPU seemingly reiterated this statement by stating

I think and I don't know if I'm the only one who thinks this way. That it's just tough, it-it's tough psychologically to think about all the 100 percent of the time, um because I just don't have the ability to or maybe that's the way I feel having...not a lot of money uhhh as a college student... but yeah, recycling is you know a fairly easy thing to do, but it's...I guess one of the only things that I can think of off the top of my head that I do.

There's a sense of "guilt" that emerged because millennials perceived their actions to be miniscule when compared to the larger issue of climate change. While this sense of guilt was evident, there's also an aspect amongst millennials in which they distance themselves from such information because of the fact that it's "tough psychologically".

While Chad addressed his struggle of thinking about sustainability and climate change, Emma reinforced this by acknowledging her own difficulties by stating

I think it's easy to go about things not thinking about this because even though it does affect us, it affects us indirectly because it's not actually affecting us as a person... it's affecting what's around us, and it's hard to put that in perspective sometimes.

In addition to the psychological stress that is felt in relation to climate change, Emma also reinforced the fact that millennials distance themselves from the overall issue because environmental changes that are occurring are believed to be indirectly affecting them. There is a lack of connection between their lives and environmental changes related to climate change because of the fact that "it's not affecting us as a person".

In addition to the stress that participants reportedly felt, they also explained that they typically do not have conversations pertaining to climate change unless they view events on social media, or it presents itself in conversations. Danielle from WPU stated

I was never taught about it. I did all, like when I was little, I like knew global warming. I didn't like know what it was, I just knew that it was a thing. But as I got older, and it became more of a problem, that's when social media taught me about it. But this, like right now, what we're doing is the first time I've talked about it in, in an educational setting, and it's not even for a class.

Whereas Emma from MSU stated

I don't think, like on a scale of 1-10, it doesn't cross my mind on a daily basis. Unless somebody brings it up... or I hear something about it and then I'll like have a conversation about it which I usually don't... like this is my first like real conversation about [climate change].

Gianna continued to build on this statement by stating

Yeah this is like...my first real deep conversation about climate change, but I feel like every time I'm in the mall or I'm like doing having plastic in my hands whatever I'm like "damn, like I'm really being really bad for the atmosphere right now."...

These three quotes also provide key insights into how millennials view climate change, but also why social media is an important source of information for them. Danielle explained that she utilizes social media as a source of information because it provided her with desired information pertaining to climate change. While social media taught Danielle and many millennials about climate change, Emma and Gianna highlighted that they rarely discuss climate change. This lack of conversation surrounding climate change deprives many millennials of information that can shed light on how actions, or lack thereof, is connected to climate change and the ability to debunk myths pertaining to climate change.

Alignment of Findings to Research Questions

The research questions explored millennials beliefs and perceptions about climate change and sustainability. The alignment of the research questions to semi-structured interview questions provided the opportunity to explore the beliefs and perceptions of millennials on climate change and sustainability. In answering questions that pertain to *why*, *what*, and *how*, statistical data that is emphasized by quantitative research would not have been appropriate for the alignment of this study. In addition, the alignment of the research questions relative to the semi-structured focus group interview questions offered the opportunity for identifying useful themes in order to determine the beliefs and perceptions of millennials in relation to climate change and sustainability.

Summary of Findings

Data presented in Chapter 4 was obtained through semi-structured focus group interviews. The purpose of this qualitative explanatory multi-case study was to explore the beliefs and perceptions of millennials in relation to climate change and sustainability. This research study followed the method as well as protocol presented in Chapter 3, in which the data collection and analysis was provided. This qualitative explanatory multi-case study focused on the four research questions: (a) What do millennials know and perceive about climate change and sustainability? (b) What strategies do millennials use in order to address sustainability? (c) How do millennials define sustainability and climate change? (d) What do millennials believe their roles are within the scope of climate change and sustainability?

I organized the data analysis from a comprehensive evaluation of the transcribed interviews according to four themes. Theme 1 pertained to knowledge and understanding. Theme 2 pertained to generations and responsibility. Theme 3 pertained to participants awareness, political power, and purchasing power, and theme 4 pertained to Emotions and Importance. Research findings revealed that 90% of millennials in the study rely on social media for information pertaining to climate change compared to 10% who are not on social media. News sources are occasionally utilized for climate change information, and depending on the individual, documentaries are viewed. While climate change is highly publicized, less than 5% of participants engage in conversations pertaining to climate change and sustainability. Chapter 5 contains a discussion of the results, limitations, and conclusions. In addition, recommendations for future research is also included.

Chapter 5

Results and Conclusions

The purpose of this qualitative explanatory multi-case study was to examine the knowledge beliefs and perceptions of millennials on climate change and sustainability. The study took place in two universities located in northern New Jersey. Semi-structured focus groups provided the context to collect data acquired. Data collected assisted in unearthing four themes. Themes were framed from the hierarchical categories of awareness-action and emotion, events and imagery, and information. Nvivo 12 Pro was utilized in order to organize the data and assign codes that emerged into themes.

Chapter 4 presented data which was amassed from the review as well as the analysis of transcribed focus group interviews. This procedure addressed the purpose of the study. Schäfer and Schlichting (2014) indicated that many individuals are unable to grasp the complex and multi-faceted issue of climate change unless they witness it first-hand. The statement by Schäfer and Schlichting (2014) was restated by many participants who indicated that they address climate change when they are presented with videos or images of events that occur as a result of climate change. Likewise, Andersson and Öhman (2017) also indicated that the utilization of social media as a virtual space is steadily rising amongst the younger population, and the participants in my focus group highlighted this fact in which 12 of the 14 participants indicated that they utilized social media for information.

Based on participants responses, findings suggest that social media assists in disseminating information pertaining to climate change and sustainability; however, social media should not be the only mechanism of disseminating information. While social media does not act as a catalyst for inspiring millennials to become climate activists, it seems to assist millennials in

generating thought provoking questions pertaining to their role climate change and sustainability. As indicated in my focus groups, an interdisciplinary approach should also be utilized in order to disseminate factual information. This interdisciplinary approach should be inclusive of not only researchers and academics who are studying climate change and sustainability, but also inclusive of individuals who possess the ability to contribute skills that foster a cohesive learning atmosphere. The learning atmosphere should be inclusive of the classroom and virtual space where conversations occur between individuals and groups of individuals. Chapter 5 contains a review of methodology, discussion of themes, limitations, and recommendations.

Review of Methodology

This qualitative explanatory multi-case study was conducted in two universities in northern New Jersey, in which the beliefs and perceptions of millennials on climate change and sustainability was explored. This sample population consisted of 14 millennials. Semi-structured focus groups were conducted, and the analysis and organization of data collection followed the research protocol provided in Chapter 3. NVivo 12 pro was utilized in order to categorize and code imported data in order to uncover emerging themes.

Discussion of Themes

Theme 1: Knowledge and Understanding

Karahan and Roehrig (2015) indicated that roughly 48% of millennials attained information via social media in 2015. However, it is likely to assume that this figure has drastically increased since this study. It is noteworthy to indicate that 12 out of 14 of my participants indicated that they utilized social media for information. Consequently, Karahan and Roehrig (2015) highlighted the need for an integration of social media into millennials education

process in order for them to better comprehend environmental issues, attitudes, as well as awareness. While this may be difficult, it is critical. Primarily because results from this research study suggests that the dissemination of information to millennials has transformed to drastically include social media. Firth et al., (2019) reiterates this by stating that the emergence of the internet has altered the way in which society accesses information.

Responses from participants indicated that critical occurrences such as the burning of the Amazon Rainforest was communicated to them via social media. While participants were aware of the occurrences surrounding the Amazon Rainforest, they did not become aware of it until roughly 3 days to 1 week after it occurred. This can potentially be a result of the crowded atmosphere of virtual space which can potentially overshadow pertinent information pertaining to climate change and sustainability. This crowding of social media is reinforced by Firth et al. (2019) by highlighting the plethora of ads, posts, etc. that manages to immediately capture user's attention. Results from this study suggest that millennials seemingly possess basic understanding pertaining to climatic change. However, compared to environmental information being transferred to millennials, information that is globally important is seemingly being undercut by information that is rarely beneficial to the preservation of society. This is reiterated by Craig and Sayers (2019), in that millennials are drastically "understudied" in relation to climate change and sustainability.

Theme 2: Generations and Responsibility

Theme 2 addressed the lack of conversations surrounding climate change and sustainability. While there is a general lack of conversations pertaining to climate change and sustainability among millennials, participants explained that there is a lack of attention and *accurate* focus on climate change and sustainability amongst various groups within society.

Participant responses were consistent with Stenhouse et al. (2018) initial claims that businesses and corporations should be included in sharing responsibility in relation to climate change.

Stenhouse et al. (2018) stated that there are individuals who believe that increasing environmental regulations will decrease and limit businesses as well as markets.

However, participant responses revealed the opposite. In that millennials explained that they would rather regulations increase in order to hold businesses responsible. Responsibility, however, is not only limited to businesses and corporations. Study results also suggested that responsibility should also be placed on politicians, in that when politicians address climate change and sustainability, information should be accurate. What is also interesting to highlight is the fact that participants explained that the use of technology such as social media would be useful to utilize in order to effectively disseminate factual information in ways that are easier to digest for the larger population which does not study subjects surrounding environmental science. This is pertinent when taking into consideration the larger issue, in terms of generational information acquisition. In that, millennial participants explained that their generation chooses to utilize social media in order to acquire information rather than reading journal articles as a resource. In addition, results showed that participants overwhelmingly held individuals responsible as well. Responses pertained to the selfishness that many individuals held in relation to weighing (what they believed to be) miniscule issues greater than climate change. Results shows that, in millennials perspective, climate change should be the forefront issue and be addressed for fear of outcome of not addressing it.

Theme 3: Awareness, Political Power, and Purchasing Power

Gray, Raimi, Wilson, and Árvai (2019) explored whether or not millennials should be expected to be more concerned about environmental issues. Craig and Sayers (2019) indicated

that environmental concerns are in fact higher amongst millennials; however, millennials are less inclined to actively participate in pro-environmental activities because they are uncertain as to what actions they can take. Responses from participants suggested that millennials are concerned about environmental issues; however, actions that they are aware of mainly pertains to maintaining their awareness of environmental issues, voting, recycling, conserving water, purchasing and utilizing reusable items, as well as utilizing public transportation or walking. While participants actively engaged in these practices, there was a sense amongst the participants that their actions are miniscule.

This uncertain feeling of “not doing enough” can potentially be linked to millennials level of awareness. Millennials may not be aware of the fact that they not only have the power to change the American economy, but also the fact that purchasing power of millennials in 2013 was approximated to be more than 170 billion dollars (Grotts & Johnson, 2013). This is important to highlight because millennials are unaware of how important and powerful their purchasing power is. While taking into consideration millennials purchasing power, there are uncertainties that arise pertaining to the requisite knowledge that millennials possess in order to sustain humanity with the Earth’s continuously changing climate (Monyei & Oladeji, 2019). This uncertainty was reiterated by many participants who explained that they are educated about climate change through social media. In addition to the social media classroom, participants also highlighted the fact that their awareness of climate change re-emerges when they come across information pertaining to climate change on social media or discuss it with peers. However, this discussion with peers rarely occurs.

Theme 4: Affect and Importance

Wells (2019) touched on various possibilities pertaining to the lack of conversation surrounding climate change and sustainability. One argument pertained to fear and fearmongering. Responses from participants highlighted this factor. Participants expressed not only their fear surrounding climate change, in that they are trapped in an endless state of shock and worry, but also the fact that data pertaining to how long society has to address climate change has been irregular in their perspective. In addition to data being irregular, participants explained that it's simpler to move through life without thinking about climate change, as well as the data accompanying it, being in the active mind-space of millennials. This suggests that millennials feel overwhelmed because they lack understanding about the social change which they can implement. Results revealed that, while climate change was overwhelmingly an issue that must be addressed amongst participants, many stated that it is not a dominant issue within their day-to-day lives. This can possibly be a result of millennials day-to-day stresses, or the outside world appearing unchanged (Wells, 2019).

Wells (2019) pointed out that damages that have occurred as a result of climate change are being experienced in many places; however, coverage and attention to these occurrences rarely occupy our active mindsets. Participant responses seemingly reinforced Wells (2019) statement. Moreover, results show that our discussion was the first time in which they engaged in a discussion pertaining to climate change and sustainability. Discussions surrounding climate change and sustainability did not occur in courses that they enrolled in. Similarly, for a majority of participants, discussions and lectures pertaining to climate change did not take place in an educational setting in schools prior to their undergraduate endeavors.

Limitations

A sample size of 7 millennials totaling 14 participants participated from two universities in northern New Jersey were interviewed. Limiting this qualitative explanatory multi-case study to 14 participants from northern New Jersey potentially posed a factor of limitation but did not contribute to a bias in data collection. Another limitation which potentially arose was restricting the age range of millennials between 18 - 28. While this did not contribute to bias and assisted in narrowing participants, it limited the ability of many willing individuals to participate in this research. Despite these limitations, my research study provided the opportunity for millennials to describe and explain their beliefs and perceptions pertaining to climate change and sustainability.

Recommendations

Recommendation 1

It is important to reiterate that Freeth and Caniglia (2019) expressed the need for an interdisciplinary approach to addressing climate change and sustainability. Freeth and Caniglia (2019) suggested that environmental scientists should partner with researchers who may not be fully knowledgeable about climate change and sustainability. In doing so, the area of research will assist in fostering learning which will also generate new approaches for researching areas in the given field. Based on Freeth and Caniglia's (2019) suggestion, I recommend that schools and university departments also embark on an interdisciplinary approach to educating students on climate change and sustainability. By providing courses in various departments that focus on climate change and sustainability, diverse approaches to addressing climate change will be posed. Such approaches should be inclusive of political education which can highlight the legality of climate change and sustainability as well as educating millennials on the history of social movements which continue to emerge every year.

In addition to political science courses, courses approaching climate change and sustainability must also be taught in the art departments. In doing so, art majors will be able to reimagine sustainable products and utilities and aid researchers in transforming the image of sustainability. This can, in turn, engage students in the debates surrounding climate change and equip them with new skills to address climate change and sustainability. This is critical when taking into consideration the fact that participants stated that, prior to the focus group, they had not had an in-depth conversation pertaining to climate change and sustainability. By addressing climate change and sustainability in cross-disciplines, we will ensure that climate change and sustainability is addressed.

Recommendation 2

In addition to various departments incorporating climate change and sustainability in various courses as an interdisciplinary approach, I recommend that professors also incorporate the use of social media into their courses. Schäfer and Schlichting (2014) highlighted that the utilization of social media has been a beneficial source in communicating climate change to society. While there are benefits to incorporating the utilization of social media into coursework, there are also potential challenges. By realizing that many millennials are informed about climate change and sustainability through social media, it is imperative that we as educators provide them with the necessary tools needed to navigate through social media's shared information. By incorporating social media into coursework, assignments can involve students finding social media posts pertaining to an environmental issue and conduct a semester-long research product pertaining to that issue. It is imperative that this not only includes acquiring factual knowledge from literature reviews in order to debunk the myths surrounding their chosen environmental

related topic, but also maintaining a journal log that tracks a shift in students thinking as they engage in this semester-long project.

This is essential because of the fact that, as researchers, we must better prepare students to navigate through the world of vast information. By incorporating the utilization of social media into courses, I recommend that professors structure their courses in such a way that generates discussions that will assist students in debunking the myths that are shared on social media. This will assist in students developing the requisite knowledge needed to sustain society by maintaining their awareness to climate change and sustainability.

Recommendation 3

Stenhouse et al (2018) indicated that there are ideological and political rifts that habitually fuel conflicts pertaining to scientific facts. Additionally, the culture of national politics typically sways attitudes and policies on climate change, inclusive of markets in relation to environmental regulations (Rootes, Zito, & Barry, 2012). Another recommendation is that, in order for millennials to be prepared to address climate change, we as researchers and professors must create a desire in millennials to shift the attitudes that can drive policies needed to address climate change and sustainability. This approach can possibly lead to a grassroots movement within universities which are led by the millennial population. These grassroots movements within universities can be used to grasp the attention of politicians, political scientists, and environmental scientists. Politicians, political scientists, and environmental scientists' partnering with these on-the-ground activists who are raising awareness to climate change must also have discussions with millennials pertaining to climate change and sustainability. Discussions, unlike surveys, can assist in exploring the beliefs and perceptions of individuals on key issues. This discussion can also be reciprocal in that politicians, political scientists, and environmental

scientists' benefit from the knowledge, or lack thereof, of millennials pertaining to climate change and sustainability. Millennials can also benefit by gaining factual knowledge about the subject matter as well as engaging in the needed discussion.

Recommendations for Future Research

The purpose of this qualitative explanatory multi-case study was to explore the beliefs and perceptions of millennials about climate change and sustainability. This qualitative explanatory multi-case study was not inclusive of students with an environmental science background. This produced the need for future research to include students with an environmental science background in the discussion of climate change and sustainability, in order to explore the disconnection between much of the readily available scientific data. Interview questions explored what millennials who do not possess an environmental science background understood about climate change data that was presented to them. However, the present study highlighted that it would also be beneficial to individuals who actively study climate change to be included in the discussion. Further research on climate change and sustainability should be explored that incorporates not only millennials, but also environmental science majors and professors in order for a greater understanding of the gaps in climate change information dissemination to be explored.

Summary and Conclusion

The general problem in this qualitative explanatory multi-case study was that some millennials who have a higher education background in a non-environmental science field appear to possess a lack of understanding pertaining to climate change and sustainability. Having an undergraduate degree in a field unrelated to environmental science can potentially result in a lack of requisite knowledge needed to sustain society. The specific problem is that the extent of the

lack of understanding which can create a disconnection between the social and spatial dimensions was not known within millennials who have a higher education.

The purpose of this qualitative explanatory multi-case study was to explore the beliefs and perceptions of millennials on the subjects of climate change and sustainability. This qualitative explanatory multi-case study can assist in providing an analysis of millennials beliefs and perceptions of climate change and sustainability. Results substantiate the research study's general problem. In that millennials who have a higher education background in a non-environmental science field results in a lack of knowledge pertaining to climate change and sustainability. Results also substantiate the research study's specific problem, in that, the level of lack of understanding may create a disconnection amongst the social as well as spatial dimensions was not fully understood within millennials who have a higher education.

Four themes arose from the three hierarchical categories of awareness-action and emotion, events and imagery, and information. Theme 1: Awareness, political power, and purchasing power, which highlighted what millennials believed their roles are when addressing climate change and sustainability. Theme 2: Knowledge and understanding explored how millennials define climate change and sustainability. Theme 3: Emotions and importance highlighted the strategies millennials use in order to address sustainability. Theme 4: Generations and responsibility explored what millennials know and perceive about climate change and sustainability.

Findings revealed that social media is a significant outlet in disseminating information pertaining to climate change and sustainability. However, social media should not be the only mechanism of disseminating information. Research findings suggest that millennials possess a lack of knowledge about climate change and sustainability. This lack of knowledge suggests the

need for an interdisciplinary approach to addressing climate change and sustainability. Findings also suggest that an interdisciplinary approach should be incorporated into climate change and sustainability research in order to more effectively disseminate information. Freeth and Caniglia (2019) underscores the importance of this point. An interdisciplinary approach to climate change and sustainability should not be limited to researchers and academics currently studying climate change and sustainability. This qualitative explanatory multi-case study concludes with recommendations on including environmental science majors in the discussion on climate change and sustainability in order to explore the disconnection between scientific data and millennials understanding about climate change and sustainability.

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Appendix A

Interview Recruitment Letter

Dear students,

I would like to let you know about an opportunity to participate in a research study titled Beliefs and Perceptions of Millennials Pertaining to Climate Change and Sustainability. The purpose of this study is to explore the understandings and perceptions of millennials on the subject of climate change and sustainability.

While there are no benefits to you being in this study, others may benefit by understanding the potential disconnects among millennials who do not have an environmental science background and the available climate change data as well as actions taken.

This study is being conducted by Rae Cade from the Earth and Environmental Science department at Montclair State University. This study will involve an in-depth focus group which will be audio-recorded. I am looking for five to eight students to participate in this study.

Requirements:

1. Non-environmental science majors
2. Individuals must be between the ages of 18-28

If you have any questions, please contact me at _____ or _____.

Thank you for considering participation in this study. This study has been approved by the Montclair State University Institutional Review Board, Study no. FYI19-20-1506.

Sincerely,

Rae Cade
Masters Student
Earth and Environmental Science
Montclair State University

Appendix B

ADULT CONSENT FORM

Please read below with care. You can ask questions at any time, now or later. You can talk to other people before you sign this form.

Title: Beliefs and Perceptions of Millennials Pertaining to Climate Change and Sustainability

Study Number: FY19-20-1506

Why is this study being done?

Although there is research that address connecting humans to the environment, there is limited research that explores individual perceptions about climate change and sustainability. Particularly, the perceptions of millennials. Therefore, the purpose of this study is to explore the understandings and perceptions of millennials on the subject of climate change and sustainability.

What will happen while you are in the study?

- You will be a part of a focus group interview, consisting of five to eight individuals
- You will be asked questions on the subject of climate change and sustainability
- The interview will be an in-depth interview
- The focus group will be audio recorded

Time:

This study will take about 1 hour and 15 minutes.

Risks:

Data will be attained via focus groups; we anticipate that your participation in this study presents no risk. As a voluntary participant, your confidentiality is assured. Additionally, you may decide that you no longer wish to be a part of this study. If you wish to withdraw from this study, you may do so at any time by contacting me. Participants will receive pseudonyms; therefore, the risks of identifying participants via responses is eliminated.

Benefits:

While there are no benefits to you being in this study, others may benefit by understanding the potential disconnects among millennials who do not have an environmental science background and the available climate change data as well as actions taken.

Who will know that you are in this study?

Your identities will not be linked to any presentations. We will keep who you are anonymous.

Although we will take every precaution to maintain confidentiality of the data, the nature of focus groups prevents the researchers from guaranteeing confidentiality. The researchers would



like to remind participants to respect the privacy of your fellow participants and not repeat what is said in the focus group to others. Please do not share anything in the focus group, you are not comfortable sharing.

Do you have to be in the study?

You do not have to be in this study. You are a volunteer, and it is okay if you want to stop at any time and not be included in the study. You do not have to answer any questions you do not wish to answer.

Your grade for courses will not be effected by your participation or non-participation in this study.

Do you have any questions about this study?

Principal Investigator: Rae Cade

Faculty Sponsor: Dr. Miller

Phone number:

Email:

Email:

Do you have any questions about your rights as a research participant? Phone or email the IRB Chair, Dr. Dana Levitt, at 973-655-2097 or reviewboard@montclair.edu.

As part of this study, it is okay to audiotape me:

Please initial: _____ Yes _____ No

One copy of this consent form is for you to keep.

Statement of Consent

I have read this form and decided that I will participate in the project described above. Its general purposes, the particulars of involvement, and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I am 18 years of age or older and have received a copy of this consent form.

Print your name here

Sign your name here

Date

Name of Principal Investigator

Signature

Date

Appendix C

Semi-Structured Focus Group Questions

1. Can you tell me about any conversations that you've had about sustainability or climate change? (RQ 4)
2. How do you get your information about climate change?
3. When you hear the word "sustainability" what do you think? (RQ 2)
4. When you hear the term "climate change" what do you think? (RQ 2)
5. What are some things that you do in your life that you feel is sustainable? (RQ 3)
6. In your opinion, where would you categorize climate change on a level of importance? (RQ 4)
7. When you hear that the Earth is warming by 2°C, what does that mean to you?
8. Can you take a look at this data, and describe what you're feeling and thinking? (RQ 4)
 - a. <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>
 - b. <https://www.climate.gov/maps-data>
 - c. <https://www.noaa.gov/news/july-2019-was-hottest-month-on-record-for-planet>
9. What do you believe your roles are in relation to climate change and sustainability? (RQ 1)
 - a. Can you tell me how that made you feel?
10. How do you think your views have changed, given that the topic has been much more central in the public discourse? (RQ 4)