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Emotional Response to Climate Change Learning: An Existential Inquiry

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EMOTIONAL RESPONSE TO CLIMATE CHANGE LEARNING: AN EXISTENTIAL INQUIRY

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EMOTIONAL RESPONSE TO CLIMATE CHANGE LEARNING:
AN EXISTENTIAL INQUIRY

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ABSTRACT

EMOTIONAL RESPONSE TO CLIMATE CHANGE LEARNING:
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This qualitative study aims to explore and explain the existential underpinnings of learning about climate change and potential emotional responses to climate change learning. Undergraduate students in environmental sciences and studies classes at the University of Washingrounded theory on in Seattle, WA participated in semi-structured interviews. Participants were asked about their experiences learning about climate change and how they responded emotionally to the learning. This dissertation examines the responses from those interviews and builds a theory out of the data analyzed. Constructivist Grounded theory as outlined by Kathy Charmaz (2014) was used to analyze the interviews. Codes were created and linked together to generate themes that undergird the theory that emerged out of the data. Analysis revealed strong themes of grief, values, and resilience that were then examined through the lens of existential psychological and philosophical concepts. The emergent theory was subsequently framed from this stance and shows a need to address the existential impacts of the climate change grief experience in undergraduate learners of the topic. Education, community, and connection to other learners of climate change played key roles in building resilience to existential nihilism while learning about climate change.

Keywords: Climate change, climate change learners, existentialism, grounded theory, grief, values, resilience, emotions, education

Dedication

Dedicated to my mom and all my relations past, present, and future.

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CHAPTER I: INTRODUCTION

The Problem of Climate Change

> For the first time in six centuries (since the great European plagues) a generation has been born and raised in a thanatological context, concerned with the imminent possibility of the death of the person, the death of humanity, the death of the universe, and, by necessary extension, the death of God. (Shneidman as cited in Firestone, 1994)

Climate change is a current and constant pressing issue that is in dire need of human attention and immediate action if we are to survive as a species. In order to survive, we humans need to adapt to the inevitable encroachment of severe weather pattern shifts, global redistribution of vector diseases, mass crop failures from salination of the soil due to sea level rise, famine, air pollution, acidification of rising oceans, and more. In facing such a horrific reality, many psychological mechanisms are at play (Clayton, Manning, Krygsman, & Speiser, 2017; Doherty & Clayton, 2011; International Panel on Climate Change, 2001, 2007, as cited in Swim et al., 2011). These include but are not limited to new cases of depression, anxiety, and posttraumatic stress disorder (PTSD). An increase in decompensatory episodes in individuals with pre-existing mental illnesses has been observed in areas where heat waves are increasing in intensity (Page & Howard, 2009). Yet, some researchers have also observed resilience in populations that have experienced severe natural disasters that are created by climate change (Bryant et al. 2014); however, the literature weighs heavily in the direction of heightened negative mental health impacts as the world heats up.

The conflict between certain policy makers and the scientific community about the very existence of climate change is palpable in today's political realm.

These two groups go head to head frequently as environmental policy has become a proverbial battleground, sending us into a gridlock pattern in regard to climate change policy development, implementation, and education. Although division is the overarching theme in the world today around climate change, there was some recent movement toward unification in the political realm with the climate talks that took place in Paris in December 2015. During this summit nearly 200 countries came together to sign a united agreement to do their part to lower greenhouse emissions. This new agreement, known as the Paris Accord, was a great success compared to its predecessor, the 1997 Kyoto Protocol, which called for emissions cuts, yet from which the United States withdrew and with which other countries failed to comply even after signing. Sadly, as of 2017 President Trump withdrew the United States from compliance with the Paris Accord, a daunting example of the division that keeps us in the aforementioned gridlock pattern (Page & Howard, 2009; Roberts & Roberts, 2018).

Given this current political and educational environment, students who come into undergraduate programs under hopeful and idealistic terms can begin to feel symptoms of stress, depression, apathy, despair, grief, and anxiety as the education process progresses (Clayton, et al. 2017). In addition, this is often coupled with hope for the future of the planet, as they begin to feel empowered by their education to enable the fight against negative climate change policy and toward sustainability (Doherty & Clayton, 2011). Further, it is not uncommon that people feel helplessness and hopelessness as they come up against the industrial juggernaut. Comprising greedy and shortsighted capitalist-driven globalization trade policies, this juggernaut is literally and figuratively fueling global climate

change by overconsuming fossil fuels at an alarming rate (Swim, et al., 2009). How does it feel to stand up and look this machine straight in the eye and learn about its devastating impact? What existential processes lie beneath the emotions that ensue? That is exactly what this study intended to examine.

Details of This Study

This study aimed to look at the emotional responses to learning about global climate change in senior undergraduate students at the University of Washington in Seattle, WA, utilizing an existential framework. Global climate change represents the possibility of total annihilation, an often-discussed topic in existential philosophy and theoretical practice. This entails not only annihilation of the self, but also of all that we know and understand as life and life's context (Brannen, 2017; IPCC, 2018; Scranton, 2015). The gamut of potential negative human emotional expressions that can stem from this knowledge, such as grief, guilt, fear, hopelessness, frustration, anger, survival coping, and so on, likely stem from the existential threat of disconnection that global climate change knowledge posits (Clayton, et al., 2013). Due to the fact that this inquiry is rooted in the study of the emotions that arise regarding serious and sudden change, resiliency factors around those experiences of change coupled with an examination of the nature of humankind and its relationship to the natural world were also observed and will be discussed.

Data were gathered using modern grounded theory methods as outlined by Kathy Charmaz (2014). Semi-structured interview questions were designed to explore and determine the presence of existential issues in this study's participants. Throughout this project, frameworks on change, meaning making, and natural world theories (Becker,

1973; Caruso & Flanagan, 2018; Roszak, 1992; Yalom, 1980) were the bases as to how emergent codes such as grief, resilience, and the aforementioned observed emotional responses that underlie these processes were conceptualized into a new theory. A phenomenological approach was explored and, in hindsight, may have served to be a better fit as phenomenology and existentialism came to prominence in relation to each other (Smith, Flowers & Larkin, 2009). However, grounded theory served as a flexible enough lens, which allowed for a blended, integrative emergence of understanding of the data and theory development. The grounded theory method lent itself to the observation of thematic patterns wherein a new theory, or understanding, of this phenomenon was developed from my chosen epistemological framework of existential philosophy, theory, and practice.

A concept to consider: Death as a form of change in existential thought.

When learning about global climate change, there is a constant reminder of death that occurs through the experience of symbolic death and actual death. Symbolic death includes events such as the loss of material possessions, the ending or shifting of the shape of relationships, change of career or moving homes, and other types of loss humans experience throughout their lifetimes. Then there is literal death such as species extinction, loss of human life, or the actual ceasing of the physical self and consciousness as we know it at the end of others' and our lives (Yalom, 1980). For this project, death is a term conceptualized as a way to express one type of change or disconnection and the emotions that occur in conjunction with the experience of this type of change. This study offers a complex examination of diverse affective responses that enlist existential phenomena that may trigger a grief response in many individuals (Clayton, et al., 2017; Cunsolo-Willox, 2012; Randall, 2009).

Further, many individuals and societies have evolved various coping mechanisms to aid in adapting to disconnection due to change. Some are constructive such as death rituals or building community support through education, spirituality, various types of groups; in other words, some form of connection, or social cohesion, appears to occur. Others are destructive such as substance use disorders, self-harm or harm to others and emotional or intellectual numbing; in other words, some form of disconnection seems to occur. While yet others (arguably most) lie somewhere on a spectrum between these two extremes. Whatever form the grief process takes, these behaviors are likely enacted in order to deal with loss and to adapt to some type of change. Given this, climate change embodies a holistic change, one that affects the self, community, and context. It is a threat of complete death of all life and consciousness as we know it, offering up a unique opportunity to study the experience of symbolic or actual death in real time with those who so bravely choose to face it directly through their educational pursuits (Cunsolo-Willox, 2012; Doherty & Clayton, 2011; Randall, 2009; Swim et al., 2009). This conceptualization was the main existential idea that framed my inquiry and will be threaded throughout this dissertation.

It is my hope that the evidence found in this study can serve to build understanding regarding change and existential disconnection as well as the experiences of humankind in the context of learning about climate change. More specifically, I anticipate that this examination will contribute to the development of new interventions and understanding that can aid in addressing client, student, and patient concerns around climate change. Last, but not least, new interventions and

understanding could help individuals learn how to become resilient to nihilistic thinking and feeling while learning about climate change.

CHAPTER II: LITERATURE REVIEW

Preliminary Literature Review

In grounded theory, literature reviews take place post hoc or after the data collection and analysis process (Charmaz, 2014; Tweed & Priest, 2014). [1] The purpose for this is that one does not want to generate preconceptions of what will emerge from the data during collection. In that way it is a bottom-heavy method compared to other qualitative methods that require an extensive literature review prior to data collection (Charmaz, 2014; Jude Bergkamp, personal communication, 2016). For the purposes of this study, requirements of the dissertation process, and having begun at first with a phenomenological method in mind, I conducted a preliminary literature review that blends information from multiple fields. These include psychology, medicine, the environmental sciences, political science, global policy, evolutionary theory, and existential philosophy. I performed a review of relevant articles of this compilation for the purposes of clarifying my research goals.

Methodological literature was explored first to determine the best fit for my topic. Interpretive Phenomenological Analysis (IPA) as defined by Smith, et al., (2009) was considered and decided upon in the early stages. However, as the project progressed, new information was revealed, and theory development began to take place, grounded theory was determined to be the best fit. This decision was made after consultation with my dissertation chair and my advisor at Antioch

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[1] This section consists of the literature inquiry goals and observations that took place prior to gathering data. I included it as it is vital in understanding the process that lead up to the main literature review section below.

University Seattle (AUS). Discussion with other students in dissertation classes who were using grounded theory informed me of Kathy Charmaz's approach, thus I purchased her book and utilized her methods for this project (Charmaz, 2014). Charmaz (2014) offered a revamped version of grounded theory that diverges from that of the original developers, Glaser and Strauss's, methods. She argued that in the post-positivist realm, researchers cannot simply "bracket off" subjectivity—they come to the table with biases and likely personal experience that influences how they interact with the data (p. 13). Given this, researchers can be allowed to recognize and utilize personal biases and be an active participant in the research. A subsequent literature search on grounded theory methods used in research on global climate change was conducted and revealed extremely few results that were relevant to my research. These initial terms included: existentialism, undergraduate learners in environmental science programs, grief, loss, resilience, education, death anxiety, and blends thereof.[2]

A search on other grounded theory literature was conducted as well and resulted in a relevant, yet small group of articles. Cho and Lee (2014) provided a write-up that clarified long-standing confusion on the specificity of the analysis process in grounded theory versus qualitative content analysis (p. 1). The data analysis process map by Cho and Lee (2014) was utilized to help me stay focused during the analysis and coding process (see Figure 1). Brinkmann and Kvale (2005) discussed the necessity to incorporate ethics into qualitative inquiry, which

[2] Please see pre-analysis search terms listed after Table One.

shaped my vigilance to always consider the most ethical approach to each stage of the research process.

Anchor Points in the Literature

As anthropogenic forcing, or human activity-driven climate change persists, the psychological community will likely begin to see an increase in negative psychological impacts in patients and clients around this issue, especially those more closely and directly affected. These communities currently reside in equatorial and desert regions of the Earth. Closer to home (for this author), weather pattern shifts and effects are also being felt in the Pacific Northwest (and other temperate regions of the world) as weather is beginning to resemble that of California in the 1980s in Seattle and Portland (Bourque & Cunsolo-Willox, 2014; Clayton & Brook, 2005; Gifford, 2008; Grothmann & Patt, 2005; Moser, 2007; Reser & Swim, 2011; Swim et al., 2011; Various personal communications, ongoing).

A portion of the initial readings compiled for this study stemmed from Australia, South East Asia, and India. One example from Australia described a disaster event known as “The Black Saturday Bushfires.” This event occurred on February 7, 2009, in Victoria Australia, wherein, on this day, some of the worst ever-recorded weather conditions occurred. The temperature reached 46°C (115°F) and winds kicked up in excess of 100 kph (60 mph). This was coupled with the preceding months being exceedingly hot and dry with nil rainfall, one example of climate change shifting weather patterns. On Black Saturday, 400 fires started at once and quickly spread at a rate of 600 meters (1,968 feet) every 30 seconds, creating an enormous front of fire as it emitted radiant heat that could kill people

400 meters (1,312 feet) away from the flames. All in all, it was estimated that the energy that the fires put out was equivalent to that of 1,500 Hiroshima atomic bombs, scorching 1,100,000 acres of land, burning 2100 homes, displacing 7,562 people, injuring 414, and killing 173 (Hickey, 2010; Victoria Police Department Press Release, 2009; Zwartz, 2009). The psychological fallout that followed this disaster was enormous. Incidents of PTSD began to pop up in droves, and rates of depression and anxiety escalated as psychologists and other mental health professionals were inundated with clients. Australian psychologists called for international psychological attention to address the ever-mounting mental health devastation that accompanied excessive natural disasters linked to climate change (Australian Psychological Society, 2009; Climate Central, (n.d.); Montgomery, 2009). One longitudinal study showed that only those most devastated by the fires and with preexisting mental illness continued to show signs of psychological distress years later and that resilience was high in most survivors (Bryant et al, 2014).[3]

Super droughts linked to rise in surface temperature can lead to extensive wildfires such as these. The 10 hottest years in recorded history have occurred since 1998 worldwide (Environmental Protection Agency [EPA], 2015). In

[3] Approximately one year after writing this the Australian fires of the 2019/2020 season exceeded these numbers. Further research is warranted as the fallout from that experience is still settling. In addition, the simultaneous occurrence of the COVID-19 global pandemic is impacting the global scene much more and is an unprecedented event for the generations of people alive today. As these two disasters subside, more will be revealed about the psychological impact of these experiences, but at the time of writing and editing this dissertation, it remains too early to tell what the impact will be in the long run.

addition, the last eight years on the west coast of the United States has become steadily drier, especially in Washington on, Oregon, Idaho, Nevada, and California. All of these states experienced record droughts in the summer of 2015. In 2017 and 2018, Washington on and California experienced record-breaking wildfires with year-round fires to be expected as the future norm ("Is Global Warming Fueling," 2018). Mentally and emotionally, the impact was heard, seen, and felt deeply by my community and myself (Various personal communications, 2015, 2017, 2018, 2019). To turn away and continue with "business as usual" is effective to salvaging one's own sanity and to aid in getting through the day in the face of horrific inevitability. In other words, it is an effective defense against the knowledge that we are going to someday die, and it is out of our hands, yet we are perpetuating the means to our end through this vicious cycle of consumption, panic, and denial. Some have likened us to becoming stuck in the bargaining stage of the grief cycle (Cassel, 2015), always looking for a way to offset, or trade, our carbon footprint. Bargaining may assuage the momentary pangs of death anxiety, but it does not address the deeper issue. It is here that psychology has a unique position where it can step up to the plate to conduct new research and develop new interventions that can take part in the health of humans and the Earth as a whole.

Further literature. The current literature encompasses a plethora of research on the physiological effect climate change has on the human race (Center for Disease Control [CDC], 2020), yet there is only a small, emergent pocket of research from psychology about how humans are affected mentally and emotionally, let alone the processes that underlie emotional and mental responses and impact (American Psychological Association [APA], 2009; Centers for Disease

Control [CDC], 2020; Clayton, et al., 2017). Psychology's contribution to the social context of climate change is a newer, cutting-edge, and emergent field. Division 34 of the APA, The Society for Environmental, Population and Conservation Psychology (n.d.), offers a consortium arena wherein psychologists interested in the interface between psychology and ecology can gather and share ideas. Thus far during preliminary literature research for this inquiry, this appears to be the only professional arena wherein psychology is blended formally with ecological concepts.

In concert with Division 34, the field of Ecopsychology, although it has been on the fringes of psychology for more than 20 years (Roszak, 1992), is up and coming and I hope will gain more footing in the coming years. The Centers for Disease Control and Prevention (CDC), The National Institute of Health (NIH), and the World Health Organization (WHO) each offer information on the physical effects of climate change on humans, yet psychological sequelae are reported minimally or not at all (CDC, 2020; NIH, n.d.; WHO, 2012), further confirmation of the call to draw much- needed attention to the psychological effects of climate change. Now let us look into the literature reviewed after data collection and analysis for this project before discussing the methods, results, and conclusions.

Post-Data Analysis Literature Review

There was an observed Earth in the psychological literature regarding the emotional experiences of climate change learners from an existential lens (Magistro, 2014). More specifically, there was a lack of literature that went into great depth from an existential lens within the literature on global climate change in general (Koole & Van den Berg, 2005; Magistro, 2014). Thus, there was much

digging around in the proverbial dark to try and shore up a well-grounded literature review during the post-data analysis phase. A lack of contemporary literature on this subject called for review of literature from fields other than existential psychology, such as cognitive-behavioral theory, sociology, paleontology, anthropology, ecopsychology, the media, and philosophy. These were examined while simultaneously adapting psychological concepts and understanding to frame the emergent theory;[4] therefore, this project and literature review is in part interdisciplinary as a result.[5]

Between December 2016 through January 2019 databases were accessed through the psychological research portal on the AUS library website. Recommendations from colleagues and committee members, gleaning information from news reports on climate change and psychology and other word-of-mouth information, was also utilized over the two and a half years. Database searches that took place between December 2016 and June 2017 focused on the psychological literature and were based on three main APA reports on the psychological effects of climate change (Clayton, Manning & Hodge, 2014; Clayton, et al., 2017; Swim et al., 2009).

This focus on the APA report was done in order to examine where psychology stood in the conversation on climate change and was reviewed as the

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[4] Literature was chosen based on emergent codes from the analysis process in conjunction with literature on global climate change itself and closely related themes such as anthropogenic forcing, or human-driven climate change. Specific codes and the emotions that defined the codes will be discussed in detail in the conclusions section below.

[5] It is important to note that although there was an interdisciplinary approach to the literature review, I consistently focused on the existential issues that underlie the psychological process of the learners of global climate change.

basis for this project as was its accompanying literature (Doherty & Clayton, 2011; Gifford, 2008; Koger, Leslie, & Hayes, 2011; Reser & Swim, 2011; Stern, 2011; Swim et al., 2009; Swim et al., 2011).

Concepts from Ernest Becker's book, *The Denial of Death* (1973) and Irvin Yalom's book, *Existential Psychotherapy* (1980) were also foundational in the early stages of research as was a heavy focus on how Becker and Yalom addressed death anxiety. After data collection, analysis, and coding, the focus of literature search terms homed in on specific codes such as existentialism, grief, loss, education, connection/disconnection, and resilience all in conjunction with the terms "climate change" and "global climate change." As research progressed, inclusion from other fields was deemed a necessity to comprehend the emotional responses to climate change. The inclusion of research from outside of psychology was also decidedly necessary because of the aforementioned lack of literature on my specific research terms. Post-analysis search terms can be reviewed in Table 1 and Pre-analysis terms are listed beneath Table 1. Next let us look at the specific philosophical influences that underlined this project.

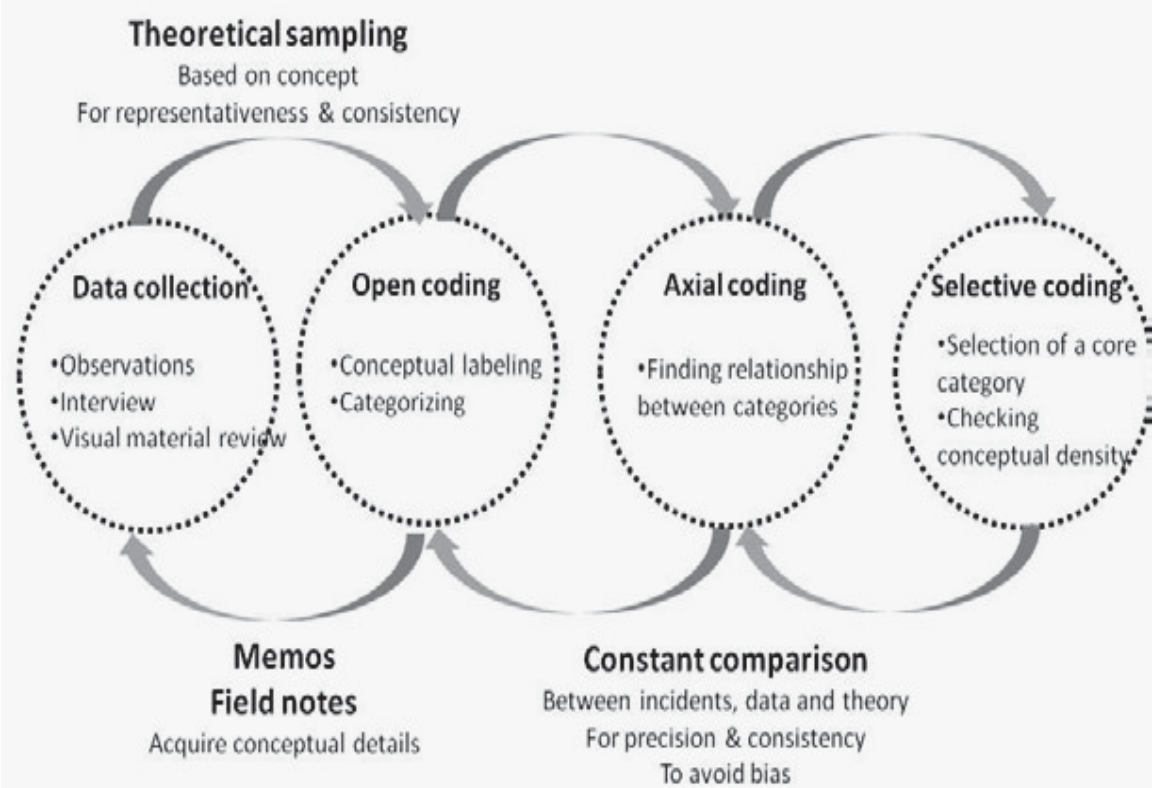

Figure 1. Data analysis process map. From "Reducing Confusion about Grounded theory and Qualitative Content Analysis: Similarities and Differences," by J. Cho and E. Lee, NSUWorks, *The Qualitative Report, 19*(32), p. 1.

Post-Analysis Search Terms and Themes

Table 1: *Search Terms between 11/28/18 and 1/26/19*[6]

Date Accessed	Search Terms	Database	Relevant Results
11/28/18	Grief + CC + Edu	PsycINFO	0
11/28/18	Grief Cycle + CC	PsycINFO	0
11/28/18	CC + Undergrads + Grief	PsycINFO	0
11/28/18	CC + Edu + Affective Response	PsycINFO	1
11/28/18	CC + Edu + Affective Response	Proquest	0
11/28/18	CC + Edu + Affective Response	CINAHL	0
11/28/18	CC + Existential Crisis	PsycINFO	0
11/28/18	CC + Edu + Existentialism	PycINFO	0
11/28/18	Human Adaptation to CC + Existentialism	PsycINFO	0
11/28/18	Existential Therapy + CC	PsycINFO	1
11/28/18	Death Anxiety + CC	PsycINFO	0
11/28/18	Meaning Making + CC	PsycINFO	1
12/5/18	Death Anxiety	Proquest	0
12/31/18	Existential Crisis + Loss	PsycINFO	1
12/31/18	Existential Crisis + Loss + GCC	PsycINFO	0

[6] Literature searches were conducted in stages from the beginning of this project and included many different search terms. In accordance to the process of Grounded theory methods, these were honed down to relevant terms regarding emergent themes that constructed the theory outlined in this dissertation. These were then compiled into Table One. Below the table, a more robust list of search terms used over the longer duration of this project is provided. It is of further note that in the final stages of literature review searches regarding my findings were sparse. That said, there were a great many books and related articles that were discovered prior to this that were referenced and cited in the literature review section of this project.

12/31/18	Existential Crisis + Loss	Proquest	0
12/31/18	Existential Crisis	Proquest	1
12/31/18	Existential Angst	Proquest	0
12/31/18	Existential Angst	PsycINFO	0
12/31/18	Existentialism + Loss + Therapy	Ecopsychology	1
1/13/19	Terror Management Theory + Nature	PsycINFO	0
1/13/19	Terror Management Theory + Natural World	PsycINFO	1
1/13/19	Terror Management Theory + GCC	PsycINFO	0
1/26/19	Neuroexistentialism	Proquest	0

Table 2: *Terms used between 2015 and 2016*

Global Warming	Climate Change Learning	Death Anxiety Theories
Global Climate Change	Climate Change Education	Optimism Bias
Anthropogenic Forcing	Existentialism	Emotional Dissonance
Grounded theory Methods	Existential Psychology	Cognitive Dissonance
Emotional Response	Existential Philosophy	Change/Abrupt Change
Trauma	Climate Grief	Education
Eco-Trauma	Emotions	Human Relationship with Nature/Natural World
Rewilding	Feelings	Security/Personal Security
Values/Values Development	Hope	Adaptation/Evolutionary Theory
Natural Disasters	Death	Resilience
Capitalism	Connection with Others/Connection with Nature	Meaning/Existential Meaning
Economy	Mass Extinction	Weather vs. Climate
Culture	Ecosystems	Ecological Terms
Specific Emotions	Ecopsychology	Climate Crisis
Grief/Loss	Energy Consumption	Fossil Fuels/Carbon Cycle

Foundational Philosophical Influences in the Literature

Classic existential thought from the likes of Søren Kierkegaard (1849, 1983), Friedrich Nietzsche (1968), and Albert Camus (1942, 1991) was surveyed with a specific focus on differentiating first- and second-wave existential philosophy. This was done in order to obtain a historical knowledge base of existential philosophical theory and its role in psychology. From a psychological perspective, contemporary ideologies from Ernest Becker (1973) and Irvin Yalom (1980, 2008) were found to be the best fit for describing emergent phenomena during this inquiry. I then followed this up with ecopsychological theory based in the work of Theodore Roszak (1992) and Khan and Hasbach (2012), whose class on ecopsychology I had the pleasure of visiting at the University of Washington (UW) and was afforded the opportunity to briefly interview him for this project afterward.

Newly emergent, third-wave existentialism known as "neuroexistentialism" (Caruso & Flanagan, 2018) was surveyed as well and was decided to be only partially contributory to my research. A redesign of this study from the neuroexistential lens is suggested, as it could be beneficial to fleshing out this phenomenon from a neurophysiological perspective. For this current study it was found to be mostly outside of the scope of my research inquiry as its focus is on existential questions in conjunction with the ever-burgeoning field of neuroscience. The posits within the neuroexistential literature offered up a framework to conceptualize human existence as a natural phenomenon as we are connected to the natural world based on the fact that we are physiological beings. This knowledge

afforded the opportunity to challenge perspectives that suggest that we are separated from the natural world (Caruso & Flanagan, 2018; Roszak, 1992).

Yuval Noah Harari's book *Sapiens* (2015) was accessed to frame the development of the human animal over millennia. The examination of our adaptation capabilities, our psychological split from nature through the development of religions and societies, and what this entails on an existential level was the basis for selecting this piece of literature. Specifically, I examined how evolution-based development contributed to the emergence of coping skills around existential threats. This examination was rooted in the conceptualization and biological fact that humans are animals in a natural world context and thus affected by evolutionary processes (Harari, 2015; Yalom, 1980).

Let us now look at the historical development of existentialism through the lens of evolution, its likely influence on existential thought and practice, followed by how the intersection of the two could be influencing how we approach climate change.

Evolution and the Rise of Existential Thought in Psychology

Yuval Noah Harari (2015) discussed in his bestselling book *Sapiens* how human beings created static civilizations to cope with their precarious and vulnerable position in the natural world. Beginning in approximately 10,000 BC with the onset of the early agricultural revolution, learning to control nature through cultivating grain and raising livestock afforded humans a more stationary life with subsequent creature comforts, more consistent nourishment, and a sense of security. As villages, towns, and cities emerged couched in various cultural frameworks, religions developed to create social cohesiveness and provide meaning

in life or a sense of connectedness (Harari, 2015, pp. 209-236). With the creation of agriculture and moving away from hunter-gatherer societies, we were afforded the room to begin to evolve new perceptions on our existence. This included new religious and spiritual ideologies, societies that were non-nomadic, development of political systems that included goods and services trades, and so on. As religions and social systems took hold for many centuries, meaning evolved out of this thinking and ways of living until the scientific revolution began about 400-500 years ago, effectively challenging the meanings that had evolved up to that point. The first challengers of these ideologies began with the likes of Galileo and Aristotle positing that forces other than God were at play in our universe. The tenets of the Church at that time were strong in creating social and economic cohesion and were threatened to the point of putting many of the new thinkers to death (Harari, 2015). Meaning as the human race knew it began to shift and change more intensively from faith to scientific inquiry. How did we cope with this? Arguably, rather poorly, but this was not entirely the case. Being able to change and shift view is essentially one of nature's greatest superpowers and it was not until the mid-19th century that science developed a term for this phenomenon.

Harari (2015) pointed out that in the mid-19th century, Charles Darwin introduced an innovative framework termed "Evolutionary Theory." Darwin's new theory broke Western thought away from the dominance of the Church and other spiritualistic and social ideologies regarding theories of existence and the origins of species including humankind (Harari, 2015, pp. 247-253). Much of the social powers that influenced what would become the bases for existential thought up until that point enforced religious ideologies that likely evolved to cope with the

experience of human consciousness, existence in the natural world, and awareness of death and to exert social control (Becker, 1973; Harari, 2015; Roszak, 1992; Schacht as cited in Crowell, 2012). Following the development and acceptance of Darwin's theory, many schools of thought began to incorporate evolutionary theory into their tenets, psychology being one, in the 20th century (Barkow, Cosmides, & Tooby, 1992).

Under this revolution in thinking and conceiving of existence coupled with the onset of the development of industry, the power of the Church gave way to the age of reason and a reconceptualization of ourselves in the natural world context was sparked. This multifaceted social evolution occurred simultaneously with the Industrial Revolution wherein reductionism became a major focus of scientific inquiry. The post-industrial era exploration of "the self" in the 19th and 20th centuries began to boom at this time, later fueling the industry of developing the concept of the self as separate and autonomous from its context (Cushman, 1994). Granted, examinations of a self-predated this time period and were usually conceived of as a soul or spirit; however, the industrialization of the human being had not been experienced prior to this. The self-ideology was especially exponential during the post-WWII era in the United States and has recently begun to spread around the world in the 21st century as new technology and American economic policy has globalized the world (Curtis & BBC, 2006; Cushman, 1994; Harari, 2015; Zinn, 2003). It was within this context that modern psychology was born, rooted in Sigmund Freud's psychoanalysis (Hunt, 2007), only slightly preceded by modern thinking about existential philosophy.

First-wave existential thought began to evolve with Kierkegaard and

Nietzsche in the mid-19th century wherein a new, post-religious drive for meaning making and self-identity began to emerge. This revolution in thought led to the second wave of existentialism with Heidegger, Jaspers, Sartre, de Beauvoir, Camus and more in the 20th century. Its impact on the new field of psychology was reflected in the work of existential psychotherapy pioneers such as Victor Frankl, Ludwig Binswanger, and Otto Rank. In the late 20th and early 21st centuries, Irvin Yalom and Ernest Becker became the new grandfathers of modern existential psychotherapy and continue to influence this orientation to this day.

In his seminal book, *Existential Psychotherapy*, Irvin Yalom (1980) defined four ultimate concerns as the following: freedom and its attendant responsibility, meaninglessness, existential isolation, and the inevitability of death (p. 8). According to Yalom, anxiety is the underlying evolutionary factor that causes an individual to defend against these ultimate concerns. He claimed that when defense mechanisms are enacted, these often create a sense of safety for the individual, but individuals likely miss opportunities to grow and adapt to new life experiences (p.10). For example, in a therapeutic setting that utilizes existential psychological interventions, building awareness of these ultimate concerns can aid clients in coping with them adaptively. Theories such as these have entered the stage on the coattails of the fall of religion and taken its place (in part) in the industrial scene. In some sense, meaning creation is an old approach, but this time it was coupled with the idea of deities removed from it. Moreover, theories such as these have been designed consciously or unconsciously to fill the vacuum that was left behind with the shift or declination of spirituality and/or religion. As is known in the world of physics, nature abhors a vacuum, and we are part of nature.

Prior to Yalom, Ernest Becker (1973) discussed the underpinnings of what leads humans to repress or deny the fact of our own death (or change) in his book, *The Denial of Death*. He identified and defined what he called the "Immortality Project" or "Causa Sui" (literally meaning "cause of itself" or "his cause" in Latin), that human beings undertake in order to design, create, and leave a legacy after death. According to Becker, it is often in the form of symbolic or actual heroism. Becker conceived of the self as an intersection between the physical self, or natural world self, and the symbolic self, wherein the phenomenon of heroism occurs (Martin, 2014). Leaving behind a legacy after death could aid in coping with life's givens while still alive by breeding a sense of purpose, even if it is an illusion. In other words, the immortality project could be considered evolutionarily adaptable. These projects may include biological legacies such as having children, creating a piece of art or research to leave behind for others to enjoy or build upon, working in a field, such as environmental studies, where one can leave their mark or provide meaning in their lives, and so on.

When looked at in a harsher light, as is sometimes the case in the post-industrial world, these projects can clash as morals and values do not always line up between individuals and societies leading to existential angst in the individual or in society. Given this lens, it seems likely that one could posit that when they consider the global climate change argument that this clash of immortality projects is likely at play in the political and economic realms that lead to resource acquisition, consumption, and control (Becker, 1973; IPCC, 2018). In my data this social conflict appears to lend itself to certain emotional responses and important existential questions. Langford (2002) discussed the phenomenon of society's need

for adversity. He claimed that the "world has always been ending" (p. 101), and it may be this knowledge of the contrast of life and death that allows for us to adaptively build a meaningful life. In other words, just like the religions with apocalyptic tales of the four horseman or other metaphors for the inevitability of change and death, we likely evolved this sense of "end" to create meaning and cope with said "ending." Therefore, climate change appears to be our modern day, tangible version of the apocalypse (Clayton, et al., 2017). Pienaar (2011) stated: Indeed, the existentialist considers death as essential to the discovery of meaning and purpose in life. Related to the latter is Sartre's notion that "being" can only be conceived of in its opposition to "not being." In other words, only in its contrariness to death can we truly conceive of life (p. 27). On that note, Landau (2017) stated that, "it is a great boon, and a great consolation, to have had a meaningful life" (p. 88). This line of reasoning lends itself to the potential need for adversity to generate meaning creation and thus resilience in human existence.

Addressing such issues as life, death, and meaning is a subjective and personal, yet also a collaborative, collective experience. It is a phenomenon that is left up to interpretation by the culture, social milieu, and the individual as they all intersect and act on meaning creation simultaneously. When met with the contextual threat of annihilation, as is the case with global climate change, the effects can seem paralyzing to some, yet provide grounds for meaning development and a sense of personal purpose in others (Doherty, 2014; Lertzmann, 2009; Magistro, 2014; Norgaard, 2009). Let us next examine the literature regarding a self-inflicted sense of annihilation by way of climate change.

Human-Driven Climate Change and Affiliated Loss: The Age of the Anthropocene

So, what does it mean existentially speaking that we are destroying that upon which we depend for life itself? To contextualize this, let us briefly examine energy usage statistics. We as a species have honed and created an energy production system that has an 80% dependence on one specific type of natural resource: fossil fuels (IPCC, 2018; IPBES, 2019; "Petroleum, natural gas and coal," 2018). According to the EPA, global emissions from fossil fuels used to produce energy was 90% higher in 2014 compared to 1900. This is largely due to the increase in energy consumption to heat homes, run industry, and transportation methods among other uses ("Global Greenhouse Gas Emissions Data," 2017). This increase in heavy dependence upon fossil fuels being a major contributor to global climate change retains a profound scientific consensus of 97% according to a meta-analysis conducted through NASA ("Scientific Consensus," 2019).

In order to understand the impact of humankind's role on climate change, let us take a look at the global carbon cycle (Figure 2). Carbon is one of the most important building blocks to all living things on Earth. Most of the fuels that humans use for energy are primarily made of carbon. Gases that are released through this process such as carbon dioxide (CO_2) play an important role in the regulation of the climate. Human activity of burning carbon-based fuels such as coal, oil, natural gas, and plant and soil organic carbon is creating a heavy load of carbon dioxide and other greenhouse gases in our atmosphere. Ultraviolet rays from the sun enter Earth's atmosphere and are then trapped by the layer of carbon trapped in our atmosphere. This in turn creates what is known as the Greenhouse

Effect. With the excess of carbon in the atmosphere, we see an exponential change in weather patterns, stronger and more devastating storms, and subsequently more devastating natural disasters. In a balanced ecosystem without excess carbon being released into the air, the Earth's vegetation would be able to absorb and break down excess carbon through the process of photosynthesis. However, humans are releasing more than the biosphere can absorb through a process defined as "anthropogenic forcing," thus leaving excessive amounts of carbon in the air, which has a chain reaction effect on our delicately balanced planetary system (A. Haymond, personal communication, May 31, 2019; Gifted Kids, 2017; National Oceanic and Atmospheric Administration, n.d.).

Therefore, in summary, the exponential use of energy sources that are greenhouse gas based has been linked to the current warming of the planet that we see today ("Petroleum, natural gas and coal," 2018; "Scientific Consensus," 2019). Consuming fossil fuels to heat homes, partaking in modern transportation methods, and keeping industry rolling forward in the name of human progress is creating the problems with the environment that we are faced with today. Given these statistics, human consumption of fossil fuels is a large contributor to the climate change process, tipping the carbon cycle out of balance just enough to wreak havoc ("Global Greenhouse Gas Emissions Data," 2017; IPCC, 2018). What these statistics mean is that even those of us with the best of intentions favoring sustainability efforts and lifestyles are still tasked with an at least partial dependence upon fossil fuels for day-to-day living. What's more is that although the world has historically sustained at least five mass extinctions that scientists from varying fields know of, based on scientific data, this current event known as

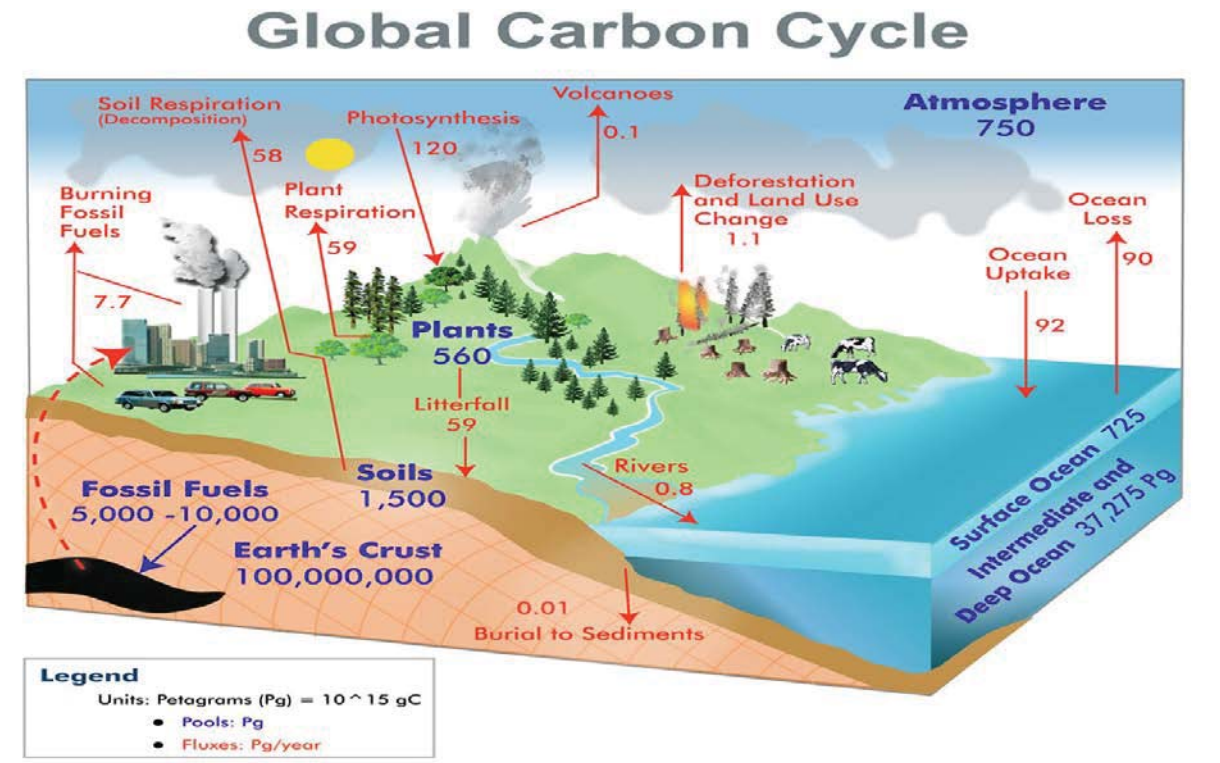

Figure 2. The global carbon cycle. The Carbon Cycle is similar to the concept of the Water Cycle. Carbon exists in different forms in different places, and natural processes move it from one place to another.

- The "storage" places for carbon are called **stocks**. They are labeled in blue in this diagram. The numbers for each stock are estimates of the amount of carbon stored in them for the whole Earth.
- The largest stock for carbon is Earth's crust. Over millions of years, the carbon-rich remains of plants and the calcium carbonate shells of marine organisms have been buried and become a part of Earth's crust.
- The processes that move carbon from one stock to another are called **fluxes**. The red arrows indicate which stocks the carbon moves from and to. The numbers show the amount of carbon that moves through each flux in a year.
- Plant growth is one example of carbon moving through the carbon cycle. During photosynthesis, plants use carbon dioxide from the atmosphere, water and nutrients from the soil, and sunlight for energy to build their structures. The carbon becomes a part of the plant's trunk, roots, or leaves; it has moved from the atmosphere into the biosphere.
- Another example of a flux in the carbon cycle is when plant materials burn; oxygen reacts with the carbon that was stored in the plant, releasing carbon dioxide into the atmosphere. Carbon has moved from the biosphere to the atmosphere (Gifted Kids, 2017).

the “Age of the Anthropocene” (Brannen, 2017; “The Age of Humans,” 2019) is thought to be unprecedented in its rate of change over time. The fact of the speediness in rate of change of climate and weather patterns over time is the hallmark differentiation between previously known extinctions and this current one, making the outcome an unknown, unpredictable factor (Brannen, 2017; IPCC, 2018).

This fact of modern living and its implications on the environment upon which we depend imply that we ourselves drive our own eventual deaths as much as we drive our survival. To frame it poetically, to live with this knowledge is to live in fear of the Reaper only to look down at our own hands and see the scythe in our grip; all of this is based on the will to survive mostly in the short term, moment to moment, and surface level, engaging mundane daily tasks that keep the post-industrial system perpetuating. Knowledge of this appears to be sparking a new kind of existential crisis that has evolved out of the roots of old existential thinking (Goldenberg, Pyszczynski, Greenberg, & Soloman, 2000).

Kidner (2007) claimed that the issue of facing the ecological contexts in the contemporary world might cause a depressive (or grief) response. He posited that this is likely because of witnessing the industrialization of wild spaces, i.e., logging, overfishing, pollution, litter, and so on may prove to be too painful to observe, suggesting our inherent connection to the natural world. This phenomenon was subsequently coined “climate grief” by the APA Task Force on Climate Change (Clayton, et al., 2017; Kidner, 2007). Further, natural contexts that are not over riddled with industry can offer realization of one’s smallness and finitude in the grander scheme of things, potentially sparking nihilistic thinking and feeling in

an individualistic Westerner causing them to close off that which is emotionally uncomfortable in order to function day to day, a forced sense of humility if you will (Kidner, 2007, p. 123). However, beyond this and contemplating the very short reality of our own existence and that of humanity as a whole, there lies the potential for new understanding of one's place in the universe and thus, freedom from nihilism's dark and murky bog (Khan & Hasbach, 2012; Roszak, 1992).

From a psychoanalytic perspective, repression of these observations of the "business as usual" free market capitalist bravado taken with regard to the natural world could lead to nihilistic thinking and feelings of despair resulting in psychological distress on the one hand, and on the other, repression of climate grief could be highly adaptable on an individual and/or immediate social level (Clayton, et al., 2017; Dodds, 2011; Lertzmann, 2009; Weintrobe, 2013). Existentially speaking, the threat of repressing observed ecological atrocities could spark questions of meaning, isolation, and responsibility to the environment and future generations while undergirded by the ever-looming threat of death or disconnection (Roszak, 1992; Yalom, 1980). Facing the natural world today versus the preindustrial era may cause higher levels or different experiences of existential angst in some, and in others a drive to act to protect the few remaining parts of the world that are left untouched by industry's drive for resource acquisition. Those individuals and groups who do not emotionally and intellectually shut down, do not repress, and have the resilience to continue with this most important work, point toward Becker's immortality project discussed above. That said, what about the experience of disconnection or grief that accompanies learning such information? In my research there was evidence of grief regarding climate change that was later

confirmed by the APA Task Force evidence that climate grief is occurring (Clayton, et al., 2017). Modern day psychology largely remains rooted in industrial-era ideological tenets; however, there appears to be an ever-growing need to evolve new ways of approaching contemporary issues like climate change grief.

Climate Grief and Disconnection: An Existential Approach

Theodore Roszak, the founder of modern day ecopsychological theory, in his book titled *The Voice of the Earth* (1992), critiqued Freud's dualistic theory on the life and death drives as outlined in Freud's work titled "Beyond the Pleasure Principle." Freud (1920) aptly named these drives "Eros and Thanatos" (Roszack, 1992, pp 44-47). He argued that the death drive always wins out in the end, that it is our nature to strive ultimately toward death while simultaneously fighting to survive. Thus, in Freud's attempt to reduce and conceptualize human meaning making and duality, we are left with the existential questions of meaning and purpose in our lives, or what Nietzsche would conceive of as a form of nihilistic despair (Freud as cited in Roszak, 1992; Goldenberg, et al., 2000; Nietzsche as cited in Kaufmann, 1975). Roszak critiqued Freud's dualism as being couched in the contemporary reductionist, industrial society of his time, which led him to subsequently delve into an argument that appears to have created an ideology of nihilistic duality between life and death. Roszak (1992) stated, "Neo-Freudianism has become, as one might only expect, the psychotherapy of urban industrial culture, sharing that culture's blithe ignorance of the greater natural environment on which we depend mind, body, and soul" (p. 60). What Roszak was suggesting was for psychology to take a shift away from the post-industrial individualism that

generates social isolation to recognizing our place in the natural world, essentially reconnecting and creating new meaning, and that it may help combat the existential despair that leads to nihilism. He further suggested and eventually founded a new approach to the treatment of such issues known as "ecopsychology," which consists of a collection of methods and theories that call for nature to be the basis framework for psychotherapeutic intervention (Derr as cited in Clayton, et al., 2017; Kahn & Hasbach, 2012; Roszak, 1992). While Roszak's theory and methods appear to have been an attempt to confront the ever-burgeoning trend of separating humans from the natural world context, in turn this approach challenges the very ideologies and policies that have helped generate global climate change by way of anthropogenic forcing through over dependence upon fossil fuels. This overdependence is largely coupled with a sense of disconnection from not only each other, but also the environment as a whole into individual worlds and stories.

To examine this disconnection from nature and expand upon Nietzsche's ideas a little more, consider the cultural symbol of capitalism. This economic system has created a separation from the natural world into insular civilizations wherein the citizens utilize the natural world for the furtherance of human interests through industrialized methods. All this occurs while not recognizing or repressing the knowledge of the profound effects that this behavior has inflicted upon the natural world, other species, and, ultimately, us. This adaptation represents what Nietzsche would term as the "decadence of modern living," or materialism, that can lend itself to nihilism (Michaels, 2004; Nietzsche as cited in Kaufmann & Hollingdale, 1968). We have essentially forgotten what we are: animals who think,

or what Becker (1973) called “the god-worm.” He stated his own concept of human duality as the following:

> Man is a worm and food for worms. This is the paradox: he is out of nature and hopelessly in it; he is dual, up in the stars and yet housed in a heart-pumping, breath-gasping body that once belonged to a fish and still carries the gill-marks to prove it. His body is a material fleshy casing that is alien to him in many ways—the strangest and most repugnant way being that it aches and bleeds and will decay and die. Man is literally split in two: he has an awareness of his own splendid uniqueness in that he sticks out of nature with a towering majesty, and yet he goes back into the ground a few feet in order to blindly and dumbly rot and disappear forever. (Becker, 1973, p. 21).

One could consider that this modern-day psychological separation of us from the natural world and our place in it, particularly in the global West, has led to normalization of existential crises as part of the culture when faced with climate change, whether it be conscious or otherwise. These crises appear to express themselves through our emotional responses to climate change information such as grief, anxiety, depression, hopelessness, and so on. Roszak (1992) developed a theory with a more encompassing manner with which to view the world and its inhabitants, much like Darwin and the philosophers from his time forward. His posit on Freud’s theory of duality between Eros and Thanatos (and by default Becker’s god-worm), appears to be a more empowering approach to these modern-day existential crises that lead to climate grief, which according to Roszak, recognition of the natural world affords us as well (Derr as cited in Clayton, et al., 2017; Roszak, 1992). We can make a meaningful existence through recognizing

that we are in a natural world context and build resilience to the grief that dualism sometimes elicits from us by looking at the context and spectrum of choices that are available (Kidner, 2007; Roszak, 1992). Through understanding Yalom's (1980) aforementioned ultimate life concerns and fostering optimism, social cohesion, education, connection, and so on we can access the meaning and purpose making offered by existential theory in order to combat climate grief and related existential crises (Clayton, et al., 2017). Under capitalism, one can potentially expect to be allowed access to a degree, or retain the belief of having access, to meaning making mechanisms such as education. One can expect, at the very least, to have the illusion of upward mobility, although, in the grander scheme this may likely come at a great expense.

One last important observation in the literature that tied us directly to the natural world was based in our physiology. Humans fit into nature as natural phenomena from a physiological perspective through how we experience traumatic events. In the literature examined, the disconnection from the natural world is discussed in terms of being a traumatizing experience over time and generations (Clayton, et al., 2017). One underlying factor regarding the loss of connection to the natural world was outlined beautifully by Lynden and Grut (as cited in Milton & Corbett, 2011). They stated the following:

> If we do not consider ourselves connected with nature, we are in a state of disconnection, and this is what shattered lives are all about. If we cannot make a link with what is outside ourselves, we cannot get to know ourselves. (p. 28).

What Linden and Grut are suggesting is the possibility of disconnection from the natural world as being harmful to self, others, and nature.[7] Disconnection in its myriad forms can lead to grief, traumatization, or other psychopathologies that may lead to nihilistic despair (Clayton, Manning & Hodge, 2014; Doherty & Clayton, 2011; Lipsky& Burk, 2009). In other words, to disconnect from the natural world is to create a void between the self, others, and the Earth itself. This disconnection provides an arena in which to deny the fact of our physiology and psychology as naturally occurring phenomena, which conceptually disconnects us from the context that gives rise to our very existence. We have done this not only on an individual level, but also on a sociocultural level through a conglomerate of attempts to adapt and control resources as our population numbers rise (Kidner, 2007; Roszak, 1992; Weintrobe, 2013). The anxiety produced by this phenomenon has not only placed enormous strain on our social, political, and economic systems, but has created heavy pressure on natural resources that affect us all whether we are aware of this cause or not. When learning about the destruction of our environment through media and other mainstream information outlets, the end result can be depression, anxiety, and a sense of disconnection or emotional numbing (Clayton, et al. 2017). If awareness is accessed, this emotional response may potentially be preceded or followed by existential crises, often times leading people to act, ignore, or feel overwhelmed in some way (Milton & Corbett, 2011; Kidner, 2007; Weintrobe,

[7] Granted, although we can, and do, design and make up who we are through some free will and identity development processes, we are also products of our biology enacted upon by our environment. Thus, the modern world may very well (and does) suit many modern humans as they have adapted to its functions and tenets.

2013). Is this not a naturally evolved emotional response to nature itself in human form?

In order to explore the concept that we are naturally occurring phenomena, let us consider the neurological response of dissociation during a real-time traumatic event. This response is considered a natural survival mechanism of the amygdala's fight, flight, or freeze/dissociation response to perceived or actual threat (Lipsky & Burk, 2009; van der Kolk, 2014). One important distinction for a prolonged trauma response (known as acute stress disorder and PTSD in cases that continue past a certain time frame) is that of an immediate event versus the persistence of the memories of the event after the fact. This persistence after the fact is what appears to be implied as the focus of the claim that climate change is an active trauma experience for many, which likely points to our direct connection and reliance upon the natural world, as well as our inherent ability to adapt and survive with trauma (Corbett & Milton, 2011; White, 2015). Further, the magnitude of the events that make up climate change are considered greater than the human mind can fully process as it is compiled of multiple events combining into a collective global disaster lending itself to the experience of disconnection from self, others, and context (Clayton, Manning & Hodge, 2014; IPCC, 2018; White, 2015). When the human brain or mind is overwhelmed with such information, the ability to dissociate in order to survive is not always a bad thing to do in many survival situations. This natural response of "checking out" is a survival mechanism that has evolved over millennia shaped by natural processes of biology interacting symbiotically with its environment (Borque & Cunsolo-Willox, 2014; Darwin, 1859; Lipsky, 2009; Reser & Swim, 2011; van der Kolk, 2014). However, when

exposed to longer term, consistent, and persistent active and ongoing experiences of trauma, in this case natural disasters that destroy generational homes and towns (e.g., Black Saturday in Northern Australia in 2009 and 2019 or the Northern California Camp and Carr Fires in 2018, or COVID-19 which is currently happening at the time of editing), shifts in the weather patterns, prolonged droughts, increased vector diseases, and so on, repressive and dissociative responses after the initial anxiety and shock response can occur (Dodds, 2011; Lertzman, 2009; van der Kolk, 2014). Although these responses can more than potentially lead to psychopathological or repressive/denial responses if not addressed, they are nonetheless quite arguably considered naturally adaptive in the face of a sense of disconnection.

Next, let us look at the "on the ground" research that I conducted for this project beginning with my chosen methodology, followed by the results observed, and end with my conclusions.

CHAPTER III: METHODOLOGY

Constructivist Grounded theory

For this project the constructivist grounded theory approach was applied as defined by Kathy Charmaz (2014). Constructivist grounded theory presents a nonlinear style methodology with which to approach a phenomenon. This methodological approach offers a systematic yet flexible, iterative manner in which to collect and examine emergent data in order to develop a new, testable hypothesis and build a new theory (Charmaz, 2014). Constructivist grounded theory is conceptualized with an ideology that embraces subjectivity rather than hard objectivity. For example, *social constructivism* embraces the idea that humans develop multivariate and individualized, as well as shared, meaning of phenomena. Therefore, it is not possible to reduce this type of data by using positivist approaches because developmental context is vital to informing the method (Charmaz, 2104; Tweed & Priest, 2014). Charmaz (2014) stated that researchers cannot simply "bracket off" subjectivity; rather, they come to the table with biases and personal experiences that influence how they interact with the data (p. 13). Given this, the researcher can be allowed to recognize and pull from personal experiences throughout the memoing process.

In the case of this project, open-ended, semi-structured interviewing was conducted; analysis took place; themes were identified; and a theory was constructed out of thematic data. Throughout the entire process, memoing, or journaling of the researcher's interaction and responses to the data, served as an audit trail of the decision-making process in order to enhance quality control and to draw attention to researcher biases (Charmaz, 2014; Tweed & Priest, 2014).

Below I will briefly define how my epistemological underpinnings were utilized, discuss the project design used for this research project, and finish this section with the analysis and coding process.

Epistemology, Project Design, and Procedure

Epistemologically, I am influenced by existential philosophical thought and psychological practice with highlights from ecopsychological and neuropsychological/neuroscientific theories. In this study I focused on observing for evidence of existential issues underlying the emotional response to learning about global climate change. I further observed for evidence of existential issues as the data emerged in the coding and analysis processes. An ecopsychological context was used to frame up the experience of the human animal in relation to knowledge acquisition about global climate change. Newly emergent neuropsychological/neuroscientific existential theory (Caruso & Flanagan, 2018) was tapped into and considered in terms of tying the fields of existentialism and neuropsychology together within the ecopsychological context. This was done in order to develop a new understanding of what it means to be a person/human animal in the context of an educational system that teaches about the effects of climate change. Furthermore, the emotional responses that emerged from this educational process were framed in existential terms, specifically threat to one's personal existence, the existence of future generations and other species, and continuance of society and planet Earth as we now conceive of it. I will now detail how this was achieved.

Participants were recruited using snowball sampling from the Environmental Sciences 2016 undergraduate cohort at the UW in Seattle,

Washington. The participants comprised 11 individuals ranging in age from 19-55 years old. They had senior undergraduate standing in the various environmental science (ES) programs at UW. The ES programs included four students in oceanography, one in fisheries, and six in the Program of the Environment. Participant demographics were gathered using the Addressing Model of Diversity (Hays, 2001). Self-identified racial and ethnic demographics included one participant of mixed race and 10 Caucasian-identified participants with 10 originating from the United States and one from Spain. Two reported having indigenous heritage with one growing up solely in white culture and one growing up in between both white and Alaska native cultures. Socioeconomic statuses reported included eight from the middle class, two from the working class, and one from the working poor. Sexual orientation included six heterosexual, three LGBTQ, and two individuals who did not disclose sexual orientation. All reported that they were cis-gendered male or female. All participants identified as being able-bodied. Three participants reported histories with mental illness (depression and generalized anxiety disorder), which were being treated at the time of interview. One participant disclosed having Attention Deficit/Hyperactivity Disorder (ADHD). Two participants were U.S. military veterans.

Internal Review Board (IRB) approval was obtained by AUS board and was not required from the board at UW. Participants for this study were chosen because they are exposed to climate change concepts and its causes in a more close-up, consistent manner than the general population. Snowball sampling is a participant recruitment method wherein the researcher obtains the contact information for further participants through current participants. For example, I was either

informed that there were others who had heard of my study and wanted to participate, or I inquired about further participants directly at the end of individual interviews. I did not reject any participants as all who inquired were determined to be a good fit for the study. Determination of goodness of fit for the study was based on their being enrolled in the environmental sciences or studies programs at UW, having senior class standing, and hailing from any age group. No emergent or clinical issues arose during interviews and further, no difficulty in meeting up with participants occurred. The interviews flowed well, and there were no unforeseen snags in the process of interviewing. To my knowledge, no emotional distress during or after the interviews was reported regarding the nature of the interview questions (Appendix C). Participants were invited to contact me via email if they had any further questions or comments. None contacted me postinterview with questions or comments. A list of resources was provided to ensure aftercare support was available to the participants (Appendix B). I decided to stop gathering data when a natural saturation point was reached. This was determined on the basis of theme repetitiveness wherein no new data was being obtained or observed. Saturation of the data began to be observed with Participant Four and consistent themes across interviews became more apparent until the final participant. As interviews progressed, I determined that the minimum range of 10-15 participants would be enough to gather the necessary data for coding and analysis. When I reached participant 11, I had a clear enough understanding of the thematic phenomena that was occurring in the participants and determined that the interview process could cease and transcription, analysis, and coding of the interviews could commence.

Interviews took place in quiet, neutral spaces including the private library rooms at the UW Suzzallo library and similar spaces elsewhere in the library if these rooms were not available. Semi-structured interviewing, a process wherein a onesided conversation ensues with loosely directive, open-ended questions, was utilized in order to conduct the interview in a conversational manner and lasted approximately an hour or two per participant (Charmaz, 2014).

Interviews began with introductions followed by the informed consent paperwork (adapted from Ermann, 2019; Appendix A). A list of resources was provided to each individual in the event that any difficult feelings arose after the interview (adapted from Spence, 2016; Appendix B). An explanation of the study's aim and interview process were given in understandable terms. After this explanation, inquiry began with pre-drafted questions asking about their personal processes and experiences in learning about climate change and its impacts (Appendix C). Interview questions were not always asked in a linear manner. As the conversation unfolded, some questions were moved to the forefront or were postponed based on the appropriateness and natural flow of the conversational interview. Some questions were omitted as interviews proceeded as they were found to be too confusing for participants or found to be redundant of previous questions. Specifically, questions nine and 13 were left out of later interviews for these reasons. The initial questions were followed by inquiry as to what brought them to this field of study in the first place. The remainder of the interview proceeded in an open fashion, unfolding loosely and naturally as the researcher always referred back to the questions to ensure that the target inquiry was being addressed; this established that the researcher and participant did not wander off

topic. With that in mind, everything that was said in the conversational interview was considered data. Interviews stopped when a natural ending point was reached, such as when conversational content became repetitive and/or redundant or there was nothing left to discuss.

Sessions were recorded using a personal Mac Book Pro® computer and a handheld recording device that were pass code protected and encrypted to maintain confidentiality. Interviewing continued until saturation of the data was achieved. Saturation was reached at 11 participants (discussed in detail above). After the first couple of interviews, *theoretical sampling* (TS) was used to determine fitness of subsequent participants. TS is a method of participant selection wherein the researcher chooses subsequent participants based on the direction of the emerging data, or theory development, in previous participants. Essentially the researcher chooses the next participants based on the observed emerging theory. In grounded theory the first few interviews shape the process of later interviews as analysis, coding, and *memoing* occur simultaneously throughout the data collection process (Charmaz, 2014). Therefore, through the process of TS, interviews shifted and improved as data collection proceeded as the researcher always referred back to the data as a foundation for how the research should continue.

Transcription took place after the interviews and was completed using the secure online transcription services by Trint.com©. Participant interviews were deidentified by using the number of the participant in the interview sequence and their initials. For example, if the participant was third in the interview process and named John Doe, it would read as P3JD. Audio files of the interviews were uploaded to the secure server and transcribed into typewritten format. From there I

proceeded through the typewritten documents and corrected errors while listening to the audio files.

After this was completed, the audio files were deleted from the Trint.com© server. Data was then formatted into a split view Microsoft Word® document wherein one side served for memoing and codes and the other side was the transcribed interview. Codes and memos were delineated using a color-coding system in the highlights section of Microsoft Word®. Essentially, main codes were highlighted with the color yellow and memos with the color purple. Other comments such as in vivo codes, research questions, and supporting data were highlighted in grey, blue, and green respectively.

Analysis and Coding

Analysis began with *open coding* wherein line-by-line analysis through the transcribed interviews took place in order to search out emotions, themes, and patterns to be used later as codes that are the building blocks for the emergent theory (Charmaz, 2104; Tweed & Priest, 2014). Next, focused coding was performed to hone in the codes with more precision. This process took place in conjunction with the literature review and was vital in informing the research process about what to search for in the literature. In grounded theory, the literature review occurs after the data gathering process. The reasoning for this is so the researcher is not pulled in any certain theoretical direction by the literature and can develop a theory based on their data after data collection and analysis without being tainted by previous research.

Enhancement of the process took place by using two techniques called *theoretical sensitivity* and *memoing*. Theoretical sensitivity is keeping a constant

open mind to analyzing the data from new and different perspectives. Memoing serves as a trail of where the researcher has been through the data. In this particular project the use of a researcher journal and the coded transcripts were used for the memoing process and were consistently referred back to in order to inform where to proceed next in the process. Memos were also used to remind the researcher when to stay on track and which ideas or data to retain or let go in terms of relevance to the newly emergent theory. These also aid in tying the whole of the emergent data together to ground the new theory in the data.

Organization of the data. Post-it® notes were used to create gerunds, or single-word labels, to group codes into larger themes. Gerund codes were written by hand on the Post-it® notes and subsequently organized on butcher paper under emergent overarching themes. Codes are essentially the framework through which to conceptualize, understand, and communicate the data from the interviews. They are the outline for how information is organized and gathered during interviews to produce a working hypothesis and newly formed theory (Charmaz, 2014). This process made it easier to identify links between the codes and reveal patterns and themes in the data, then subsequently seek out previous research in the literature review process. Throughout analysis, constant comparison was utilized to stay grounded in the data to shape and inform which steps to take next in the research. As grounded theory is a nonlinear process, codes and categories were relabeled as needed.

Participant packets were compiled during initial coding, which consisted of a printout of the participant interview, a list of specific codes and memos, and the interview question list with comments from the interviews. These were used to

create the butcher paper process with the gerunds mentioned above. Next, Venn diagrams and theoretical maps were outlined by hand in order to visually conceptualize the emergent theory observed in the packets. Multiple Venn diagrams of three overlapping circles where drawn out to aid in conceptualizing the new theory. These were filled in with codes and emergent overlapping themes. Finally, a theoretical map was then designed out of the packets and Venn diagrams into participant-specific codes on one larger piece of artist's paper. Each participant was given a list of codes that emerged in their specific interview and then compared to each other as a whole to identify emergent themes that became the baseline for the new theory. Finally, *theoretical coding* was utilized to enable the development of a story, which emerged from the interconnected, coded data. Constantly comparing the new data to the old, newly emerging themes were watched for until saturation was reached. Saturation occurred when repetition and redundancy of themes and patterns in the codes was apparent, and no new insights were being gained from the data (Charmaz, 2014; Tweed & Priest, 2014). *In vivo codes* are direct quotes from the participants that support or are evidence of the phenomenon being studied. They will be used as supporting data in the results section. Next, I will discuss the results of my study.

CHAPTER IV: RESULTS

> Nothing is as painful to the human mind as a great and sudden change.
> —Mary Shelley, *Frankenstein*

In this study, I aimed to examine the phenomenon of climate change learning, the potential emotional responses in ES students, and then explore it from an existential lens. Below I have provided and organized the in vivo codes that

addressed my research questions. The overarching themes, or main codes, consisted of changeinduced grief, the role of values, and adaptation to change in the form of resilience by way of education. Below each of these headings I have provided evidence to support the presence of these processes in my participant population in the form of themes, or codes, that emerged during the coding process. These codes will then be discussed in the subsequent discussion section.[8]

Participants discussed their personal values regarding nature and the experience of these being threatened by human-induced climate change-related phenomena, what is known as anthropogenic climate change. A grief response appeared to occur in each participant, thus leading them to educational pursuits, i.e., seeking of meaning, purpose, and empowerment through education. Education appeared to offer up an arena to reinstate a connection through collective knowledge acquisition and mutual action with co-learners. Furthermore, this connection development appears to have stemmed from a values development process that oftentimes began in childhood either from exposure or, in a couple of cases, lack of

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exposure to the natural world that later led to the realization of one's nature deprivation.

Next, I will present the codes that show evidence of grief potential regarding the emergent grounded theory code of "change", followed by codes that

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[8] Please see Appendix D for data table with full list of in vivo codes with corresponding codes and subthemes.

reflect participant values, and end with codes that evidence adaptation as marked by observed resiliency factors such as empowerment and hope instillation through education.

The Codes: Change and Grief Potential

Evidence of the main themes regarding change-inspired grief and loss was marked by an overarching theme, and that is this: Human industry and activity appears to greatly perpetuate feelings of grief regarding climate change awareness if repression of the knowledge does not occur (Clayton, Manning, Krygsman & Speiser, 2017). The emotional responses pointing toward the presence of a grief process included feelings of hopelessness, sadness, anger, frustration, fear, anxiety, worry, distress, disbelief, and overwhelm. At its baseline, this portion of the data pointed toward Jean-Paul Sartre's claim of "L'enfer, c'est les autres (hell is other people)" (1944).

However, a complex dichotomy emerged such that although this was a fitting statement to a degree, people were also the key to sustainability. It was this duality that appeared to cause both grief and resilience within this participant population. Some of the grief observed was rooted in the nature of the change being studied in that we simply do not know where the Earth or nature will end up with current minimal response to climate change. This unknown was acknowledged by almost all of the participants and almost always in reference to the consumptive behavior of humankind. I will now lay out the portions of the interview process that support the presence of grief in this participant population[9].

[9] Something that I would add to my codes that was recognized during the editing process is the phenomenon of empathy. It appeared that empathy played a vital role in these

In Vivo Codes: Evidence for the Presence of Grief Precursors[10] The relationship between various types of change and grief is well documented. Not all change causes grief; however, generally speaking, loss, a form of change, is correlated strongly with grief responses in human beings (Kübler-Ross 1969, 2005). When participants were asked about how they felt regarding learning about climate change in their environmental studies classes, they responded much sadness and frustration. Although this is not always indicative of a grief process, it is possible that it could lead into a longer lasting grief response. In addition, later on I will illustrate how education plays a vital role in building resilience to falling into a grief response by way of empowerment.

The interview excerpts provided below show participants expressing their emotional response to climate change learning. These emotional responses were woven together to make up and support evidence of the potential of grief response, including sadness, frustration, anger, and interference with one's wellbeing[11]:

> **P1:** …it's really difficult to see all the ways we're fucking things up and not feel like we are destined to be one of the species that goes extinct. I don't feel like we have a great chance to survive. The only way we are going to survive

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> as a species is if we make significant changes and we make them now. Quickly.

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participants engaging in environmental studies. There was much mention in interviews of wanting other people to care about the environment and feeling saddened when they appeared to not care. It may be that this was perceived as a lack of empathy from society at large and thus emotions such as sadness and frustration were experienced by the participants. I highly recommend further study of this specific phenomenon, specifically the role of empathy creating a sense of connection and well-being.

[10] Please see Appendix D for a data table with a full list of in vivo codes with corresponding codes and subthemes.

[11] Please note that participants were identity coded using P1, P2, P3…and so on.

Interviewer: So how do you feel about that?

P1: How do I feel about that? It's sad, yeah, makes me sad, 'cause I have grandkids, you know, I have people that I care about that are a lot younger than me…and you know, they deserve an opportunity to hang out on this planet.

P2: …regardless of any human impacts, species come and go all the time because the Earth is always changing so it's…it makes me sadder when it's because of something that people did that made them go extinct.

P3: It's sad, it's terrible, it's horrifying that we're so oblivious to what's around us, you know, I wish there was some way to make people care…I'm very frustrated, very, very frustrated.

P5: …I think…what you learn is that, you know, I think that natural processes are pretty darn good and that the interference that we've caused as humans, what you call anthropogenic interference from these natural processes…that's what interferes in my sense of wellbeing.

I have provided below my observances as to what is likely causing the emotional response to climate change in this participant group. It appears that human activity, (aka: anthropogenic forcing), as well as economic and political policy appear to be the most likely factors. These abstract, intangible factors lend themselves to a feeling of powerlessness that appears to lead to varied emotional responses in this population:

Interviewer: Are there other emotions that come up that you haven't named here?

P7: One of anger.

Interviewer: Anger.

P7: Because I mean we're causing it and we can do things and…fix it. I feel like we're too far-gone to roll back everything but we can make the impacts lesser. So we're just not doing it because of economic interests, which is probably my biggest gripe, but humanity as a whole at this

> moment is so concerned about money, which is a made up concept, over our future lives.
>
> **P8:** I am strongly convinced…that species extinction rate is increased because of human activity and it makes me really sad.
>
> **Interviewer:** So, you're sad because there's this anthropogenic aspect to the rate at which things are going extinct?
>
> **P8:** Exactly. I mean things die off. We all know that there's a natural extinction rate, but we've really put the gas pedal on that. It's concerning, sad.
>
> **Interviewer:** Concerning. So you're concerned.
>
> **P8:** Yes.

Evidence of values at play in participant's emotional responses. Values regarding nature appear to develop from that of fostering a connection with nature early in the lives of the participants. This likely occurred through personal experience either from direct contact with the natural world or a recognized lack thereof later in life, an impactful educational experience, or a combination of both. In this section I will provide evidence of values development and its impact on meaning and personal purpose seeking for participants. This was evidenced by observed values including responsibility, humility i.e., "walking lightly on the Earth," love of nature, drive to help, reciprocity, educational pursuits, connection, concern for future generations, and their views on capitalism and policy:

> **P1:** I feel privileged to be able to go back to school and study something that I feel passionate about, I feel a certain amount of responsibility based on what our history has shown of how humans interact with nature, and things that we've done or our ancestors have done to harm the planet, so I guess I feel some...no I don't guess, I know I feel some responsibility to help with that, so, studying it.
>
> **P4:** I realized like probably the most important thing to me is nature by being in it and yeah, it helped me develop my own values and being

> somewhere beyond here [this was in reference to one of her tattoos regarding nature] is just mentally like I feel beyond the tiny little town I was raised in and beyond all those little problems like fights with my mom and…like being far away from my dad because he still lives in Illinois. It just puts me on a different level, like joy and contentment.
>
> **P5:** …We've [older generations] enjoyed the cars and the houses and stuff, you know, just growing up in this area that we need to take larger responsibility to set a leadership pattern that says you know living more lightly on the Earth, that's what's cool, that's what is a sign of success, That's…the new sign of wealth.
>
> **Interviewer:** So, do you feel there is a purpose or meaning to the work and studies that you do in the environmental sciences?
> **P7:** I think my love of nature has grown since it became a major because before living in the woods, I knew the woods were beautiful and I loved being in there, but I didn't know the names of practically any of the species. And now that I do it's as my professor says, like, you look outside, and you see your friend.

Adaptation and resilience. Below is the observed evidence for resiliency factors that appear to lead participants to adapt to the intensity of emotion that accompanies learning about climate change. More specifically, empowerment through education coupled with personal values appears to help participants cope with the emotional responses they may experience. These resiliency factors were observed as acceptance of the unknown, empowerment through education/mentorship, community**,** following one's passion**,** hope**,** and development of purpose that effectively combated nihilism, all of which culminated into building resilience that lends itself to continuance of the work:

> **Interviewer:** So, you don't feel very positive about our future?
>
> **P2:** Not super positive, but like that being said I don't think that's a reason to stop trying or to like give up and also I think that because things are gonna continue to change that it's really important to study what we have right now, um, so we can monitor how it's changing.

> **P6:** I actually went to Friday Harbor Labs to study marine zoology and so that whole time I was out studying the ocean organisms, like maritime stuff, walking around going into the forest collecting samples, that kind of stuff, so it was a really cool way to kind of just get away from all the industrial societal norms and with the world and kind of get to a place we can really just focus on what you really want to do and I felt really connected to the world and like, everything around there. So, it was really cool.
>
> **Interviewer:** So how does it feel for you emotionally?
>
> **P6:** Kind of like empowering almost because I found out that…because you always hear about how like the ocean's screwed and that kind of stuff and you just like, well what if it's not because we're actually making the effort to do something about it.

One participant was a teaching assistant. He had a unique position in terms of being a student but also being an educator. He bridged the gap between learner and teacher thus revealing a fascinating overlap in his educational empowerment process.

This was what he had to share from his unique viewpoint:

> **P8:** Seeing when I can actually impart something, and I imagine is what probably all educators feel, but for me in particular with the environment, seeing when folks are seeing the things that I see, you start asking those questions, are inspired or a fire has been lit under them for whatever reason, I like seeing that and if I can steer them in directions of understanding the climate change problem, then I've done my job.
>
> **Interviewer:** You feel like you've fulfilled your meaning purpose?
>
> **P8:** I've fulfilled my meaning and purpose if you can say 'I know what climate change is'. I know that it's real. I know that I have an ability to impact that with my actions.

Then, later on in the interview, he spoke to his experience of what it was like for him to be a student learning about climate change:

> **Interviewer:** OK so your education is kind of framing it and giving a foundation to it?

P8: Right.

Interviewer: Your passion and your meaning.

P8: Exactly it's filling it out and making it better for me.

Interviewer: Right and filling in blanks and giving you language.

P8: Yes. Yes…it's getting [me] more psyched, it's getting me more motivated. I feel like it's putting more energy, or I feel like I have more energy now in my senior year than I did when I was starting when I transferred or even when I left my career and went into school again. I feel like it's just powering me up.

Interviewer: You feel empowered?

P8: I do. I do.

P9: I think honestly, this is like a really cheesy line, but I do think that knowledge is power. I think having the knowledge and reading about it and learning about it is only going to benefit.

Interviewer: So, education counters hopelessness?

P9: Absolutely, yeah…everybody has this hope on some sort of level. An anthropology professor told me that once.

Interviewer: What brought you into this field of study?

P10: Came to U-Dub, immediately environmental studies had some amazing teachers, and stuck with it. Which put me ahead of the game and I was able to find my passion sooner than average.

Interviewer: So, you feel hopeless, or…if you were to sum it up into a couple of words what would the feelings be?

P11: I mean I currently feel hopeless, but hopeless slash maybe optimistic that we can do something.

Interviewer: Ok, what helps to feed the optimism?

P11: Seeing that there's other people that feel like me.

Interviewer: Sort of like a collective of people that have like-mindedness.

P11: Yeah.

Interviewer: What helps you carry on, what keeps you driving in this work why do you keep doing it?

P11: Because I think it's needed and I personally get replenishment from the environment so, even if it's hard I think I need to do it.

Interviewer: So, you're fighting for something you love it sounds like.

P11: Yeah.

Next, I will conclude with a discussion of this data and weave that into the explanation of my grounded theory.

CHAPTER V: DISCUSSION

The themes throughout this study included an observable factors that could lead to grief in participants regarding global climate change learning, a clear valuesbased foundational thread that led each individual to seek out what they can do to address climate change, and the role of education in building resilience to existential nihilism. Resilience building led participants to feeling more effective in creating social change regarding sustainability even though they continued to live with grief around this issue. Without the aspects of community, purpose building, and empowerment that the educational process provided them, many individuals would likely fall into apathy, grief, or existential nihilism regarding global climate change. With their education they felt as if they had a fighting chance to make some impact toward living in line with their values; no matter the size of the contribution, it provided existential meaning for them.

Given this, my conclusions are that simply learning about climate change without solutions can likely promote a grief cycle that has the potential to lead to existential nihilism or apathy and possibly denial in extreme cases (Lertzman, 2009; Norgaard, 2009). Ultimately, it was empathic connection in myriad forms in the context of the educational community that allowed for individual participants to build resilience to falling into apathetic nihilism.

Below I will provide a brief recap of the main themes for contextual purposes followed by my theory regarding the existential underpinnings that are foundational for these themes.

The Role of Values in Climate Change Learning

For this participant group, values provided the context in which the emotional experience of learning about climate change occurred. While reading my theoretical posit, it is important that the reader retains the lens wherein personal values contextualize the process of climate change learning. For all of the participants in this study, values regarding climate change began to develop in childhood. Through this developmental process they acquired meaning and purpose around the natural world through building a relationship with it in a myriad of ways, i.e., working in conservation as a youth, spending time in a favorite park or natural feature, traveling to other countries to do conservation work, and so on. For a couple of them, their values developed from noticing a lack of access to nature or their preferred natural feature such as the ocean in the case of Participant 2 (P2) and "green spaces" in the case of Participant 10 (P10). I conclude that it was their values that drove the process of wanting to create a sustainable world for future generations and that this is what led them to seek educational pursuits that would afford them the opportunity to do so.

The Experience of Grief-Based Emotions in Climate Change Learning

The most common emotional thread throughout the participants in this study was that of the experience of grief-like feelings. Grief-like feelings (grief) were observed as occurring in response to learning about climate change impacting what they loved and valued, i.e., nature, other species, and future generations of humans. Grief was experienced prior to seeking a college education as that was revealed to be a crucial time for the aforementioned values development about the natural world.

That said, grief was reported to be most prolific at certain times during the educational process. Most notably they reported feeling the most "depressed" during what they called "doom week," which usually takes place during week nine of the academic quarter in various ES classes, particularly in the first year. At this point in the quarter in many early environmental studies classes, students learn most intensively about the issues that climate change is creating and most notably that humans are generating its perpetuation. Participant 1 (P1) shared that she was "depressed" for the first year of her education because of this steep and emotional learning curve. Later in the interview, she identified that she was in fact experiencing grief. Participant 5 (P5) shared her grief around witnessing what she described as "car trash" along the road while she rode her bike and the loss of a favorite stream on a hike she had done many times before. Her dog would drink out of the stream, but it had dried up due to rising temperatures that caused a drought. It appears that loss of traditional natural features, or signals that enforce their personal values, i.e. consistency, created an opening wherein grief could enter and take hold. Each participant, pointing to the presence of a grief process occurring, reported experiences such as these.

There is a flip side to this observed experience of grief, however. Participant 6 (P6) and Participant 2 (P2) shared that their educators would often follow "doom week" up with the final week's discussions focusing on solutions to the material presented during "doom week." Even with this "solutions-focused" follow-up, there was still an air of the presence of grief cycle markers in participants. This occurred when speaking about climate change after the full scale of the initial grief experience subsided. The contrast of these learning experiences

created what I have deemed “a hope against hope phenomenon” to occur for these learners. Adaptation to the experience of grief while learning about climate change was pervasive in this population. The instillation of hope through education was noted as most effective toward warding off nihilism by way of building hope and thus resilience while empowering students with knowledge about what they can do and that what they do does make a difference. In conjunction with this phenomenon, resilience was built as well with meaningful connections with the material and each other (see below).[12]

The role of education in building resilience to existential nihilism. As noted above, the experience of grief was pervasive in this participant population, but education played a strong role in building hope and thus resilience through empowerment. Empowerment is key here to resilience building in that it armed the participants with an in-depth knowledge of what to do, how to take action, how to speak with others about environmental issues, and how to decipher research and media fanfare from what is actually occurring. Critical thinking skills were developed around the issue of climate change and appeared to assist greatly in adapting to the existential concerns of hopelessness, grief, and overwhelm that can occur when learning about such a topic.

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[12] One limitation of this study is that the population interviewed was still engaged in the environmental studies or sciences fields. It is recommended to study those individuals who do not stay in this educational major in order to compare possible contrasting data regarding grief and long-term sustainability practices.

Bringing It Together: The Existential Lens

As anyone can see, my grounded theory is multifaceted. It consists of grief surrounding environmental despair, or eco-anxiety and is existentially threatening, yet

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it also consists of education serving as a buffer to nihilism regarding the studied phenomenon. I chose this topic because degradation and impending loss of our environment is quite literally the threat of our nonexistence as a species. This posits that we are facing an existential crisis so enormous and complete that our minds struggle to fathom its profundity. It is no wonder that many humans individually and collectively revolt and turn away from this horrifying proposition likely out of mere self-preservation. We medicate our grief under the guise of diagnoses such as depression or anxiety while our impact on the entire structure upon which our very lives depend goes greatly ignored. We have arguably evolved to compartmentalize painful experiences in order to carry on with the day-to-day task of survival. That said, this form of adaptation has likely allowed us to avoid acknowledgment of existential crises and, ultimately, the knowledge of the fact that we, as a species, are going to die.

Compartmentalization can be a detrimentally effective skill whose side effect and benefit consists of the perpetuation of capitalist civilization. Yet when one comes to a point in their lives wherein the ability to retreat into modern creature comforts is no longer effective—for example sex, substances, and other forms of vice no longer work to quell and soothe the emotional pain of one's personal existence or vapid lack of meaning—many begin to question the point of

their lives. Droves of humans seek solace in religion or spirituality whereas others seek comfort in scientific inquiry. Educational pursuits, such as those of my participants, have served to help answer questions of existence for thousands of years, yet ultimately, we all die, most of us alone, and none of us knows what the purpose of this life is in actuality.

In circumstances such as these, one might consider the existential absurdity as presented by Albert Camus (1942) in the Myth of Sisyphus with his main, and most important, question of suicide and whether or not to commit it. In that vein, the consideration of our human predicament that was presented in Samuel Beckett's play *Waiting for Godot* (1952) is an important metaphorical enactment of the existential absurdity we all face internally if one is so inclined to think on it. Beckett's character Vladimir states in a moment of clarity regarding the absurd nature of his day-to-day living:

> Was I sleeping, while the others suffered? Am I sleeping now? Tomorrow, when I wake, or think I do, what shall I say of today? That with Estragon my friend, at this place, until the fall of night, I waited for Godot? That Pozzo passed, with his carrier, and that he spoke to us? Probably. But in all that what truth will there be? He'll know nothing. He'll tell me about the blows he received, and I'll give him a carrot. Astride of a grave and a difficult birth, down in the hole, lingeringly, the gravedigger puts on the forceps. We have time to grow old. The air is full of our cries. But habit is a great deadener. At me too someone is looking, of me too someone is saying, he is sleeping, he knows nothing, let him sleep on. I can't go on! What have I said?

What Vladimir is illustrating is a moment that many humans in contemporary Western societies experience and grapple with, addressing it largely with self-doubt and avoidance in order to carry on. This is where my participants engaged in a different, more personally fulfilling way by addressing our current climate crisis and mass extinction based on their values. All the while they wondered how to best reach others i.e., connect, felt a multitude of emotions leading to grief, seeing the absurdity in fighting the powers that be but doing it anyway because it provides them meaning, hope, and resilience to carry on with a life they feel is worth continuing regardless of the ecological devastation that encroaches around us.

I am left with wondering if this is an innate feature in human beings that drives us to survive. I would surmise likely yes, but further study is warranted to address this question. The absurdity presented by Beckett and Camus can lead one to feel lost yet oddly validated when examining phenomena such as climate change and its inherent threat of nonexistence. But the question is this; does that really matter? Does our misunderstood existence in a scarcely understood realm really matter to our day-to-day functioning, our values, and what we do with them? Is existential absurdity a rabbit hole worth exploring when facing something as enormous as climate change? It can be a fairly dark and lonesome prospect to live with this reality; thus, based on my data, it bodes well to learn how to create personal purpose and meaning, whatever that looks like for the individual, which was what appeared to be taking place in my participants.

One important question in my interviews that was seemingly unimportant later in the interview process was question number 13 where I asked, “Do you feel there is a purpose or meaning to the work and studies that you do in the

environmental sciences? How did this meaning develop? What is its essence?" During interviews this question was met with confusion and often-blank stares wherein the participants wondered about the word "essence" in particular. As interviews increased, I myself began to grow frustrated with this question, not really understanding its point and eventually removed the essence part of it from the last couple of interviews to promote fluidity and ease during the process.

However, it was while writing this dissertation that the importance of this question of essence emerged. While reading Camus and other writers who regard the absurdity of life, I had an eye-opening experience with this question and its responses. That importance is this: Life is absurd; we know not where we are which I have stated prior, and what I saw in my participants when they were faced with this posit of "what is the essence of your meaning and purpose in the work you do?" it fell away like sand through their fingers or ash in their mouths because life itself is fleeting. Climate change is one, if not the largest, current example of this. More pointedly, our responses to it are the ultimate example of the fleeting nature of existence. It was a perfectly imperfect moment wherein the illustration of life's unknown nature was revealed and that we are free to create our own perceptions however we choose to. We are here today and gone tomorrow, all the while we have evolved to create meaning and find whatever is purposeful in spite of the terrifying unknowns of existence. It is the great game for the survival of our species to play mental games of meaning with each other and ourselves in order to individually and collectively carry on. The absurd offers us an opportunity to go "salsa dancing with our confusion" (Walker, et al., 2002) and examine the sheer meaninglessness of it all, which in turn affords us the opportunity to examine what

we appear to fear and simultaneously crave the most: the freedom to create our own meaning.[13]

Unfortunately, most people in our current cultural climate do not experience the necessary empowerment to embark on such a brave endeavor, largely because they have not the social or economic privileges afforded them in order to do so.[14]

I am not implying that life is solely a bleak image or made up of dark meaningless shadows, but because the American mindset is so very attached to goaloriented dichotomy, I find it necessary to address this and point out the many possibilities in between. These middle grounds can lend themselves to developing personal meaning and purpose, as was the case with my participants and their educational pursuits. If we see not the absurdity of existence, how can we find the rich and dense meaning that lies within that absurdity? If we cannot understand the nature of our existence in such a way, then it is doubtful we will discover what sustains us in terms of meaning and purpose. We tend toward hedonism with the axiom of "do whatever makes you happy" while winding up in our "own private Idaho" trying to figure out what it is about life that is making us feel so isolated and alone. I argue that it is the lack of understanding of the grey area between these constructs of black and white where the richness of life exists and that it takes

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[13] An examination of the existential concern of freedom is well illustrated in Irvin Yalom's book *Existential Psychotherapy* (1980).

[14] An examination of the sociopolitical and economic reasons for lack of access to exploration of existential issues are often cordoned off to those with access to the upper classes of society, a factor that is extremely important, but beyond the scope of this dissertation.

embracing the pointlessness of it all to reach the crescendo of this paradox to explore our values and thus, deep and rich meaning in life. It was within this context that my participants through their (and my) confusion around the examination of what essence is, that showed me the crux of this research project.

The crux is this: Humans are indeed in an unknown and seemingly meaningless universe, yet we remain the masters of our own perceptions if we so choose to see it as such. The dance between the self and one's context is more often than not going to present the individual with challenges of whether or not life is worth the effort, the most important of those questions being that of suicide or other forms of resignation (Camus, 1942). What follows is a question about personal meaning wherein the participants struggled, but they found and named what gives them the steam to keep on in this life, at least at the time of the interview. The question regarding essence became a moot point until examined in hindsight in context with the data. Wrapped together, one can see that actively choosing to create and focus on personal meaning and purpose gave these participants a sense of connection and fulfillment in spite of the grief and sadness they all felt about climate change. That they retained hope in the face of such mass environmental destruction shows just how resilient the development of personal meaning and purpose can be and that it can provide the means to continue on in spite of the absurdity of it all. Perhaps out of this realization, one can surmise that the most important question to ask patients and clients is that of what it is that

keeps them going in this life. In the absence of an answer, it is the job of the psychologist to hold a space where that meaning and purpose can be explored.

What's more, it appeared that the value of acceptance was key in moving forward toward the inevitable impermanence of our predicament. To know that all that we love and the Earth that we live on are simply not going to last forever and we will likely never know why must be accepted if we are to live meaningfully. My participants were not fighting for a lack of change, rather, they accepted that change was inevitable and to accept this and adapt aided them in living a meaningful and purposeful life as well as helped them to remain resilient to guilt, shame, and nihilism. As Camus (1942) stated, "the struggle itself toward the heights is enough to fill a man's heart. One must imagine Sisyphus happy". Further, as Antoine de SaintExupéry (1943) wrote in his book *The Little Prince*, "It is only with the heart that one can see rightly; what is essential is invisible to the eye" (pg. 70).

As it pertains to my research population, I suggest that these factors are at play in these individuals. They sought meaning in the shape of developing a relationship with the natural world, witnessed the exploitation and degradation of that world, turned to face the details and etiology of that degradation, and sought meaning, personal purpose, and eventually hope via their educational experiences regarding this phenomenon. The emotional process of grief was the tell-tale marker for the proverbial existential vacuum that studying such a topic can generate. However, this grief was assuaged with the instillation of empowerment through receiving an education that built resiliency to this more-than-potentially nihilism-inducing quagmire. This was essential to helping these individuals carry on with

their existential meaning and purpose. Without education, these individuals just might have been subject to cognitive and emotional dissonance regarding their relationship with nature and by being part of the anthropogenic problem posited by theories of human overconsumption of natural resources. Educational pursuits provide an arena wherein the curious and existentially concerned individual can come and explore their concerns, learn about potential solutions to their concerns, and seek meaning in the form of what they can do to address the phenomenon of climate change and educate others.

Finding mentorship, community, and action as well as evidenced-based solutions to the climate change issue gave this population resilience to the inevitable constellation of feelings that make up the grief cycle to carry on with the work, thus feeding their existential meaning and purpose. Ultimately, we do retain the power to choose; albeit the argument of the existence of free will is beyond the scope of this dissertation, the evidence from my inquiry does support that despite a dire and impending perceptibly slow (on a human time scale) environmental decline, we can still learn to choose our view regarding this phenomenon and experience.

If educational pursuits and other similar challenges offer up a life of meaning, substance, and possibility to create one's own personal purpose, then connection plays an extensive role in the creation of personal meaning and purpose. As Vladimir stated in the above quote, we are, indeed, "astride of a grave" but our personal lives lived alone are not the point of this existence. We cannot survive, learn, build resilience, nor obtain health and wellbeing in a vacuum. We need communities such as the educational community, work, family, and friendships to

help us grow and cultivate personal meaning and purpose. Therefore, the aspect of connection to others and community played a quintessential role of resilience building in my research population. Through our collective evolutionary legacy, we hold in our hands the power of relationships with self, others, and contexts to provide meaning and affect social change regarding climate change. Existentially speaking, we stumble astutely and blearily across the span of existence couched in the space-time continuum, we cope with this ultimate of known unknowns the best we can, and although we have no idea what, where or who we are, we can still have connections and theories that can help us cope and feel a bit more comfortable within our ever changing, yet patternistic, predicament of existence. Thus, education does indeed build existential meaning through community building as well as resilience and adaptation to this largely unknown universe.

This study attempted to examine, digest, and describe the ocean of human time and experience that we call life as we watch our only home burn, drown, and shift drastically and as other species cling to life in the wake of human mass consumption and ingenuity; we are indeed witnessing the sixth mass extinction. The pockets of humanity where individuals exist and come together to confront the goliath of the postmodern, industrialized world of capitalism offer hope in the inevitable dark night we are leaving our children. Regardless of this fact of modern life, this is still a beautiful world, even when it is overwhelming and heartbreaking to watch our own hands break it apart for greed that is largely an act of seeking security in uncertainty. Alas, that is not the sole piece of this complex puzzle. If we shift just enough, there is hope; if we meet change with just enough change to affect sustainability, that could be enough for future generations of not only homo

sapiens, but multitudes of plant and animal species to thrive on the new Earth. What my participants taught me as I rolled through my own waves of desperation and grief around learning about climate change was to never give up hope; instead, see the solutions and connect with those who are working to affect change. Stay close with those who are fighting change with change. Embrace humility, seek a simpler lifestyle, and be more considerate and conscientious about the choices I make. Although this was a doctoral dissertation that utilized the scientific method to examine specific phenomena, it was also a quest and self-appraisal of consumptive behavior of resources such as food and fossil fuels, but also of each other. It has rendered me more aware of how I use resources and of those young ones who follow after my generation and beyond. Further, it was an unintentional, but nevertheless important examination of the nonhuman lives that depend on this planet for life and how to coexist with them in as balanced and respectful a way as we can. This was a study of awareness—of ourselves, the context we coexist in, the resources we depend on for life, the diversity we experience and what happens when we knock it too far out of balance. It has been, and continues to be, my hope to add, even just a little, to this understanding and coping. Thank you for reading.

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APPENDIX A

Informed Consent

Informed Consent

Thank you for your willingness to participate in this research study. I hope to gain understanding about the processes of learning about climate change and its emotional impact. It is my hope that this study will inform clinical practice and services to support people affected by climate change and to begin a shift in the relationships between humans and nature that is mutually beneficial. I appreciate your willingness to share your experience. Thank you!

By signing below, I acknowledge that:

- My participation in this research study is voluntary and I may withdraw at any time.
- Measures will be taken to protect my privacy through encrypted storage of documents and separation of identifying information from interviews. However, if I disclose information that raises questions of a threat of harm to a child or vulnerable adult, the researcher is required as a mandated reporter by Washingrounded theory on state law to report this information to Child or Adult Protective Services. Reports of my child or vulnerable adult hurting me are not required to be reported.
- I understand that discussing these experiences may be uncomfortable or upsetting. A list of support resources will be provided upon request.

Signature

Print name

For Office Use:
3: Permission letter

APPENDIX B

Referral List

Referral List

Although it is not a common event, it is not unusual that someone could become distressed by thinking about and talking about climate change. If this happens to you, you can interrupt or terminate your participation in this research without consequence.

If you are in immediate danger, go to the nearest emergency room or call 911.
You can also call the 24-hour King County crisis line at:
Toll-free: 866-4CRISIS (427-4747)
Local in King County: 206-461-3222
(Note that you can call confidentially and anonymously.)

If you find that would like to speak to someone and are not in immediate danger, you can consider the following resources:

- You can contact your primary health care provider
- Seattle Therapy Alliance – Affordable counseling for women http://seattletherapyalliance.com/ Phone: (206) 660-4396
- Shepherd's Counseling Services – Specializes in survivors of sexual abuse http://www.shepherdstherapy.org/ Phone: (206) 323-7131
- Therapy Collective
- Community Counseling & Psychology Clinic at Antioch Seattle http://www.antiochseattle.edu/student-campus-resources/campusresources/mental-health-counseling/community-counseling-and-psychologyclinic/
  Phone: (206) 268-4840
- Washingrounded theory on Information Network 211 – Community Resource Database http://www.resourcehouse.info/WIN211/ Phone: 211
- Washingrounded theory on State Psychological Association www.wapsych.org - click on "Find a psychologist"
- Sidran Institute – Traumatic stress education & advocacy Email for local referrals with specialty in trauma treatment: http://www.sidran.org/help-desk/get-help/
- International Society for Traumatic Stress Studies
  Clinical Directory: http://www.istss.org/source/cliniciandirect

APPENDIX C

Research Questions

Research Questions

1. Share with me if you feel so inclined, a time when you felt connected to nature. What was that like?
2. What are your thoughts and feelings on species extinction?
3. How do you feel about the future of the human species/the planet/other life forms on Earth?
4. Do you ever feel anxiety about the future in regards to our planet/species? Do you feel something different than these? Please elaborate if you will.
5. What is climate change? How do you identify and define climate change?
6. How do you feel about the current state of the climate?
7. If you feel comfortable doing so, would you share what lead you to this line of study/work/etc?
8. What is it that keeps you going in this field of study? What helps you carry on?
9. Tell me about your emotional response to learning about the hypothesized impacts of climate change. How, if at all, has studying this affected how you feel overall/about climate change/etc?
10. Do you ever feel fear about death? Your own, others, or the planet or other species? Follow up.
11. How does your work as an ES student tie into this meaning/purpose?
12. Do you ever experience grief about the impacts we humans have had on the Earth? Or do you feel something different than grief? Please tell me what that is like for you.
13. Do you feel there is a purpose or meaning to the work and studies that you do in the environmental sciences? How did this meaning develop? What is its essence?
14. What is the meaning of life for you? What does this existence mean to you personally?
15. Is there anything that you would like to add or any questions for me?

APPENDIX D

Themes, Subthemes, and Supporting Data

Themes, Subthemes, and Supporting Data

Main Themes (Stimuli or Experience)	Subthemes (Emotional Response or Coping Skill)	Supporting Data (In Vivo Quotes)
Change/The Unknown • Learning about anthropogenic (human caused) climate change. • Unknown future	• Grief/loss emotional response • Existential angst • Hopelessness • Sadness • Anger • Frustration • Fear • Anxiety/Worry • Distress/Disbelief • Overwhelm	**P1:** "…it's really difficult to see all the ways we're fucking things up and not feel like we are destined to be one of the species that goes extinct. I have, I don't feel like we have a great chance to survive the only way we are going to survive as a species is if we make significant changes and we make them now. Quickly." **Interviewer:** so how do you feel about that? **P1:** "How do I feel about that…uh it's sad, yeah, makes me sad, cause I have grandkids, you know, I have people that I care about that are a lot younger than me, that I care about and, you know, they deserve an opportunity to hang out on this planet, it's a pretty rad planet." **P1:** "I feel anxiety when I think about future generations." **P1:** I did get really depressed for (me: depressed) yeah for a portion of the beginning of my environmental studies programs… I think it is directly related to the material I was learning." **P2:** "…regardless of any human impacts, species come and go all the time because the Earth is always changing so it's not like [paused to think]…it makes me sadder when it's b/c of something that people did that made them go extinct." **P2:** "…we can look at that however you want but just like in regards to the environment that we have, um, I think that we messed up a long time ago and there's no way to undo that." **P3:** It's sad, it's terrible, it's horrifying that we're so oblivious to what's around us, you know, I wish there was some way to make

		people care…I'm very frustrated, very, very frustrated. **P3:** I'm really…it's sad it's, I'm again frustrated you know I think about future generations, what are they going to have to look forward to? --- **P4:** "I think that people don't care and people don't understand and I do feel like more angry and anxious about that and more just like sometimes hopeless about that because I like know that that's what I want to do I want to go into climate change research and even paleoclimatology as science like it's pretty thankless because people are just like who cares and like I don't believe you." --- **P5:** From my own standpoint I feel like studying the environment generally and the ocean specifically is probably the most important line of research that I could possibly be in right now. I think things are changing fast and we can't really get a handle on quite how quickly the whole environment the whole climate is changing. And so I think the oceans will a big part of that. **P5:** But it's not my own personal emotional distress it's just it's distressing. **P5:** It's overwhelming. I don't feel disrespected personally. I feel like the planet's been over run. I feel a sense…I feel overwhelmed personally when I think what am I going to do to help correct this. **Interviewer:** Do you feel stressed about it [cars and greenhouse gasses]? **P5:** Everybody's stressed in traffic aren't we...especially…if you're in a hurry. So um, do I feel stressed? Yeah distressed is a better word for some reason there's um, active stress. I mean when you're bicycling there's active stress that you might get hit. Yeah. But I

		wouldn't. Just distressed now if I think about it's distressing.

		Interviewer: The overarching theme is you feel a sense of distress when you think about climate change and what climate change is doing? **P5:** Yeah. **Interviewer**: So what are your thoughts and feelings on species extinction? **P5:** It's distressing. Yeah. I'm using that word a lot. I should probably look it up. I mean it's sad…I mean it's a loss it's a sense of great loss just like a death because it's permanent, but the death of a friend or something it's not coming back. And the sad part about it is the fact that it's not coming back may or may not be a natural part of the way nature has things and whether you want to call it…God's plan, the flow of the universe, nature's way and we want to frame that if…we as humans are doing things to cause extinction that, that's distressing…If it's you know maybe a…normal thing where a species no longer would survive in nature just based on the way it all works out, that's cool…I don't like the interference, the active human interference. **P5:** I grew up here and then I went to school on the East Coast and I worked out there so I've lived as much time, 30 years, on the East Coast as I have here. And the reason that that's important is I can come home where I used to come from, from the East Coast and I can see that there were fewer trees like somehow the landscapes were you could see longer. If you're living there you can't see it going away. But when you're away for a year or two then you come back you realize how many just how many trees have gotten mowed down. And every time... **Interviewer:** …What kind of sensations does that leave you with? What kind of thoughts and

		feelings do you have around that vision of less trees?

		P5: Fewer trees, um, I have so many thoughts about that. I mean it opened up the sky it's brighter and I guess in that regard that might be good for some people's view but I get back to sort of the sense of sadness maybe a little bit of anger, frustration that people have mowed down these trees to improve their view or to make a bigger house or you know whatever they're doing. I was at my parents the other day, they're elderly. And I was in their home and I looked at the back to the backyard and they were over in Bellevue. And it used to be a big maple tree with big white big wide leaves and this thing was huge. It was the biggest Maple Leaf biggest maple leaves you'll ever see in your life and it was just the biggest tree of the world and that's what I looked at as a child that we used to go play in the leaves and took forever to rake it and stuff. And now someone's built literally like I don't know it's probably a 15, 20 thousand square foot home. It's like backs right up to my you know my parents property and they you know build some sort of like shrubbery to try to block and you can't and so, I'm like, that's a really big difference to have this huge oversized home that looks really more like a lodge or a, you know, or an institution. **P5:** …I think in both cases what you learn is that you know I think that natural processes are pretty darn good and that the interference that we've caused as humans, what you call anthropogenic interference from these natural processes. Right. That's what interferes in my sense of wellbeing. **Interviewer:** So, anthropogenic interference. **P5:** Yeah. It's kind of a good term… **Interviewer:** Can you describe the lows to me, what those are?

		P7: Just feeling very cynical about how the world works. There is clean energy that we can use and we're not because we're subsidizing coal and oil instead of subsidizing solar and wind and hydro and it's just frustrating. **Interviewer:** So what are your thoughts and feelings on species extinction. **P7:** It's pretty shitty, but it's the way the world works. I know that the current extinction is vastly accelerated because of human actions. But I do know that species go extinct. That is the way the world works. But the rate is upsetting. **Interviewer:** Upsetting. So underneath the upset what would you say the emotions are? **P7:** Just sadness loss of biological diversity that future generations won't be able to see and enjoy and I don't know about because their species are going extinct that we don't even know about. **Interviewer:** Are there other emotions that come up that you haven't named here? **P7:** One of anger. **Interviewer:** Anger. **P7:** Because I mean we're causing it and we can do things and not fix it. I feel like we're too far-gone to roll back everything but we can make the impacts lesser. So we're just not doing it because of economic interests, which is probably my biggest gripe, but humanity as a whole at this moment is so concerned about money which is a made up concept over our future lives. **Interviewer:** Do you ever experience grief about the impacts that we humans have had on Earth? Or do you experience something other than grief? **P7:** Yeah because when I was on my hiking trip being in the old growth forest was so cool and then all of this is like that and these huge trees like sad they're gone and I

		wish I could have seen them when they were here…

		Interviewer: What are your thoughts and feelings on species extinction? **P8:** [speaking to the Endangered Species Act] You know what it's trying to do but at the same time it's like well you know we're sitting here trying to protect something yet we're sitting here trying to destroy the thing that's going after this thing you know is the northern spotted owl just destined to just go away and that we can just sort of need to come to grips with that. Are we kind of spinning our wheels trying to save something, but…do you know I am strongly convinced that you know that species extinction rate is increased because of human activity and it makes me really sad. **Interviewer:** So you're sad because there's this anthropogenic aspect to the rate at which things are extinction. **P8:** Exactly. I mean things die off. We all know that there's a natural extinction rate but we've really put the gas pedal on that. It's concerning sad. **Interviewer:** Concerning. So you're concerned. **P8:** Yes. --- **Interviewer:** What are your thoughts and feelings on species extinction? **P9:** …it makes me really sad but at the same time I definitely believe in evolution and adaptation and I don't know how I feel about interacting with nature as a human as hard as that is it's hard to just think about species disappearing. It's heartbreaking. You know because you have like that feeling, you know that empathy and I don't know if empathy is the right word but just that sense of like connection even, with that animal and knowing that you know maybe I'm the reason that they're dying. **Interview:** How do you feel about

		the future prospects with regards to climate change? With that in mind

		how do you feel about the future of us? **P9:** I think that we're screwing ourselves. **Interview:** What's the emotion behind that? **P9:** Anger. **Interviewer:** Anger. How are we screwing ourselves? How would you say, how would you unpack that? **P9:** I think that we live in a society of convenience. You know we have everything that we ever could really want at our fingertips. You know. And we don't know how to be uncomfortable. You know. Like if I'm hungry I go eat. You know if I'm tired I go sleep you know I have a bed. I have a roof over my head. And yeah there are a lot of people in this country that don't have that. But there's a lot of people in this world who don't have that option. And I think that first world countries are primarily the ones. I think that we have like, we have the resources to change our patterns. But you know I think it's human nature to not like change. So it's hard, it's easier to talk about it but to actually implement that change and. Just change the way that we live, change our patterns. Probably going like way off just. Think about future generations and how they're going to live how we're impacting their lives and some, many of those people aren't even born yet they're not even here or the people who are born and they still don't have an option. You know the people in these countries and islands near the equator that are ultimately going to be gone. We like to drive our own cars by ourselves and we like to fly all over the world and do all the things that create you know climate change. --- **Interviewer:** So like if you were to identify the emotions underneath that what would they be?

		P10: Let's see. That's one of the few fields where I'm not optimistic. Because it's going to, it's bad and it's…going to change quickly. It's hard to put an emotion to it because it's changing so fast and that hasn't been experienced before. Just why this research is important. Maybe like curious and nervous. **Interviewer:** Curious and nervous but it's hard to put a feeling to it because it's so rapid, the rate of change is so rapid is what I'm hearing is that fear? **P10:** Yeah. **Interviewer:** What is climate change? How do you identify and define climate change? **P10:** I can give you an abstract…version. **Interviewer:** Absolutely. **P10:** I think the definition is scientific. I think of plastic and anything similar to plastic where we're using energy, taking energy emitting energy to essentially use it and bury it underground. So to me it seems like taking energy out of the system of things and in turn that has its consequences. So climate change has been changed from global warming climate change because of the other inverse effects. **Interviewer:** So you see it as like a depletion of energy? **P10:** Yeah, that's well said. **Interviewer:** So…what does it mean to you to witness depletion of energy, meaning, the emotions? **P10:** It's kind of similar to losing anything. Yeah. So grief... **Interviewer:** So how do you feel about the future of the human species, the planet, and other life forms on the Earth? **P11:** I feel like human species is greedy and opportunistic. And we have some good people, but the way we've done things for so long is just, it's about greed and perpetuating suffering on other

		people. I can't, I can't see how we're all going to get along and

		progress to a place of like understanding and realization that everybody is the same. I mean I don't know how we're not there. I can see why we're not there but the fact that we're still exploiting the Earth to the detriment of all future generations with no end in sight just boggles. I can't wrap my mind around it. **Interviewer:** How's it feel? **P11:** Hopeless again. **Interviewer:** How do you feel about the current state of the climate? **P11:** We're fucked. **Interviewer:** We're fucked yeah, so kind of despair or how would you define that feeling? **P11:** It's like a mix of despair and angry and I don't know, it's like a huge range of emotions. But there's also hope, hopefulness in there being like what like what can I do and how can we how can we change this around? Because like... **Interviewer:** And you believe we can change it? **P11:** Oh I don't know if we can change it. With the amount of carbon we're throwing into the atmosphere, like, maybe we can but I think there's going to be a cataclysmic event before that happens. I just don't see any other way for people to change because we don't care about, well we use a super broad statement but like as I see it the majority of people can't see past their own lives. And even if they have kids that can't see past their own lives and they say they want better things for their kids but nobody does anything about it.

Values • Values development appeared to start in childhood for participants.	• Responsibility • Humility • Love of nature • Drive to help/Urgency • Educational pursuits • Community/connection • Legacy and tradition Future generations Views on capitalism	**P1:** "I feel privileged to be able to go back to school and study something that I feel passionate about, I feel uh (pauses) a certain amount of responsibility based on what our history has shown, uh, of how humans interact with nature, and things that we've done or our ancestors have done to harm the planet, so I guess I feel some...no I

		don't guess, I know I feel some responsibility to help with that, so, studying it" **P1:** "We had the stream out back and the…summer times were always centering around that…I'd say that's where I felt connected at that point as a child…That's, I think where the foundation comes from, for my love of nature" **P2:** "it wasn't necessarily like a huge emotional breakthrough, um, that like connection with nature, but um, I just had a lot of questions and I decided that I really wanted to answer them." **P2:** "I've always really loved learning um, and I'm really passionate about it" **P3:** I've loved everything living in the ocean I just, even more so than anything living on land, I've always loved the water, I used to swim…I love the water and everything and I just felt this connection, like I want to study these creatures, and be around these creatures for the rest of my life. They're so fascinating and there's so much we don't know, they're also just so cute. **P4:** "I realized like probably the most important thing to me is nature by being in it. And yeah it helped me develop my own values and being somewhere beyond here is like just mentally like I feel beyond like the tiny little town I was raised in and beyond like all those little problems like fights with my mom and place like being far away from my dad because he still lives in Illinois. It just puts me on a different like levels like Joy and contentment you know." **P4:** I think we have a responsibility to do something because it's probably our fault.

		ME: So the emotion behind that is. **P4:** Urgency. **ME:** Urgency. ok so, urgent, a sense of urgency.

		P4: Like. I don't wanna say compassion but like empathy. **ME:** Empathy for? **P4:** The other animals the other organisms on this planet. --- **Interviewer:** Let's see. So how do you feel about the future of the human species the planet and other life forms on Earth? **P5: "**That's a really good question. I give this a lot of thought because it's, I mean, it's even a big thing…I have a son. You know my friends have kids I have nieces and nephews and they're young people around me. Sometimes I'm just like I just want to say 'hey guys I know we're so sorry…you know I wish I could have done better.'" **P5:** …we've enjoyed the cars and the houses and stuff you know just growing up in this area that we need to take larger responsibility to set a leadership pattern that says you know living more lightly on the Earth, that's what's cool that's what is a sign of success, That's…the new sign of wealth. **P5:** Sometimes people think of comfort and to them, at least in my cohort, it's like 'oh let's go down and let's take a plane to Arizona and go to a spa you know and let's have white robes and be all fluffy, we might get a massage and maybe be a really warm swimming pool and there might be walking paths where you can take a two mile walk.' I mean in a beautiful space where the temperature is almost perfect in your food it is organically grown because you have the wealth to get the organic food. OK. Some people might think of that as comfort and to me comfort is having just a simplicity to your daily life where you can you know be out in nature and sit in the, you know, sit on a log, or, you know, maybe it's a grass or even a park bench, it's real nature

		and not plastic nature like, here, we put a decorative pond in. **Interviewer:** So it's wildness versus consumerism.

		P5: Yeah…it's wildness versus something that's sort of like you got someone looking to make money based on how they've defined comfort for us. And I think many Americans fall into what comfort is like with a 10,000 square foot home, to be comfortable we need a microwave we need, I mean, I don't have a microwave and people ask me why and one of the reasons is that we're so far from growing our food and cooking our food it's like, I have a gas stove and I have a flame, there's fire. So maybe taken it a little bit far, but it gives me a sense of well being to not be in the world of plastic not literally plastic but so what people have told us is comfort. **Interviewer:** What's being sold to you. **P5:** Yeah what's being sold. Exactly. **P5:** …live lightly and give other people the space to lean in to do what they think is important as well. And you know in that process hopefully you, you make friends you have a nice time together, there's joy of life…because people are doing what they think is important, you're discussing it with other people and people's…ideas are building on each other and that makes for a better, a better life and hopefully a better planet. --- **P7: …**after I got into the major I was all selfish [with] my intentions because I just wanted to work outside because I would run in the woods and I lived in the woods. So I just was in nature pretty much my whole life. **Interviewer:** You grew up in the woods. **P7:** Yeah. [Values Development] **Interviewer:** That's important to you to have reciprocity that's something you value it sounds like. [giving back to nature] **P7:** Yeah.

		Interviewer: So do you feel there is a purpose or meaning to the work and studies that you do in the environmental sciences? **P7:** I think my love of nature has grown since I became a major because before living in the woods I knew the woods were beautiful and I loved being in there but I didn't know the names of practically any of the species. And now that I do it's as my professor says like you look outside and you see your friend. **Interviewer:** What does this existence mean to you personally? **P7:** Only thing that popped into my head, I can't remember who said it off the top of my head but it was, I learned about her, she was, we've read some of her stuff in communication for environmental studies students, and she was a native and she was talking to this board or this gathering of people and she said she went to her elders and asked for advice on what to say and they just said "moccasin" which is a shoe with also means to walk lightly upon the Earth. And that's what I feel like it's not to leave a small footprint and not change things drastically. I feel like that's my existence what I want my existence to be. **Interviewer:** Is to walk lightly on the Earth. What's the emotion behind that. If you're successful how does it feel? **P7:** I want to say pride but that's so self-centered and conceited. But that would probably what it, the end goal would be. But I would do it out of reverence for the planet. **Interviewer:** So what is it that brought you into that line of work? **P8:** I spent about 10 years in the insurance world and towards the end of that I really started to…first of all the corporate structure was really kind of becoming tiresome for me but I wasn't feeling connected to the environment

		anymore. I spent 10 years in a windowless box type office. You

		know I think it was the deprivation and as I decided I was going to leave work and go back to school I was trying to decide what I wanted to do and I really felt like I needed to connect back strongly to the environment. **Interviewer:** It's like a collective view point for you, sounds like, rather than an individualistic viewpoint. **P8:** Right, right. Yeah I mean just seeing you know where all this money was going and who is benefiting it's benefiting banks was the work that we did, just not satisfying to me and it's like I, I have a lot of talent and passion and enthusiasm for the environment and I was wasting it and I needed to stop it. **Interviewer:** So your work was not satisfying or unfulfilling. **P8:** Was unfulfilling. **Interviewer:** Would you call any sense of meaning or purpose? **P8:** Yes. Actually. That's a good, I never thought about that. **Interviewer:** What is the meaning of life for you? What does this existence mean to you personally? **P8:** Well you know I'm not a religious person so I'll put that out there. We're not here to serve in my opinion to serve someone to be good to not be good or whatnot. But I think as human beings we're on this planet to take care of each other. At least that's what I feel like we should be doing. [Observation: We should be taking care of each other but largely we are not and I think that is what sparks grief in these individuals.] **Interviewer:** So you feel like it sounds like you really value community. Like deeply value the collective of humanity. **P8:** Absolutely. And I think, I feel we just don't get enough of it. **P9:** I think honestly this is like a really cheesy line but I do think that knowledge is power. I think having the knowledge and reading

		about it and learning about it is only going to benefit. **Interviewer:** So education counters hopelessness **P9:** Absolutely, yeah…everybody has this hope on some sort of level. An anthropology professor told me that once. --- **Interviewer:** So share with me a time when you felt connected to nature and what that was like for you. **P10:** I think that growing up in a place without a lot of forests, ground or nature kind of made me understand that there was something missing from my environment... **Interviewer:** So growing up with out nature. **P10:** Yeah. **P10:** Changing what's going on means you're aware of what's going on. And I think the awareness itself is important. --- **Interviewer:** So sustainability, what is sustainability? That's a good question. Do you want to take a stab at it? **P11:** Being able to live within the constraints that the Earth can provide without destroying it. **Interviewer:** So maintaining life? **P11:** Yeah or maintaining an equilibrium with the Earth. [Values balance in life]

Adaptation/Resiliency Factors	• Acceptance of the unknown • Empowerment through education/mentorship • Passion • Hope • Existential purpose that effectively combats nihilism Continuance of the work	**P1:** "Other days when I talk to some of my professors, like, in particular Kristy, I can't remember her last name, but Kristy has been doing this work for many years and I'll ask her how do you handle this? And that's when she gives me good advice to focus on the goals, I mean there is hope, we can do this as a society and this is why you're here, to help us do that so, she's great to talk to when I'm feeling that way. I talked to her a

		few times last quarter I was in class." **P1:** "I think we constantly are seeking what our, what's the purpose here, what's the meaning of my life, why am I here, and I think that question is constantly going on in the back of your head as a person. Let me put this differently, for me, it's constantly going on in the back of my head, why am I here, what's my purpose, what's the meaning of being here? And I have to say there are days where I'm like pfffff! What the fuck does it matter? You know, and then there are other days that I spend and it almost always has either some sort of connection with nature or with people, that I feel as <u>though I've helped in some way"</u> **P2:** "I ended up applying to take the inverts biology class at the labs and I did that last summer and it like blew my mind I was like wow this is the coolest thing ever this is definitely what I actually wanna do with my life." **Interviewer:** "So you don't feel very positive about our future? **P2:** Not super positive, but like that being said I don't think that's a reason to stop trying or to like give up and also I think that b/c things are gonna continue to change that it's really important to study what we have right now, um, so we can monitor how it's changing." **Interviewer:** "do you ever feel fear about death? Your own the planet others and other species? **P2:** uhh, not really like, it's kinda weird cause like I'm terrified of the ocean, which is part of the reason why I want to study it and what I've done to grapple with that fear is that accept that I might die anyway like it's just, I'm gonna die, period, that's gonna happen, and dying studying what I love at the hands of such a tremendous force like the ocean is a cooler way of dying than most other ways of dying."

		P2: "I try to not wallow in the grief and the sadness and the despair and the hopelessness." ME: But does it come up for you? **P2:** "yeah, usually just like, split seconds and then I'm like, get away… It's not great, like that's not any way to live, and I'm not dying right now, so I can still do things. So I think that it's better to like… ME: Keep hope alive kinda deal huh? **P2:** Yeah, even if I'm not like totally on board with it all the time, I think it's a valid argument, there's lots of valid arguments, like you can argue it doesn't matter and we've messed it up and we're all gonna die, and that's fine, but that doesn't sound fun (laughs) that doesn't sound like a great way to live, sounds like being sad all the time, who has time for that?" **P2:** "I've never really grappled with like existential crises, like that's never been an issue for me I've never felt so like, basally useless that um, that's been an issue like I feel useless all the time but I also know that in the grand scheme I don't matter very much which is kind of comforting, um, so I guess I have that concept that I don't matter in the grand scheme, but it's more comforting than like stressful." **Interviewer:** so the rate of change is harming (P3: yes the rate of change) gotcha, ok. So how do you feel about the current state of the planet? **P3:** I feel like we're in trouble, but I also feel optimistic I feel like we could turn it around… **P4:** (SENSE OF PURPOSE) How I feel about oceanography. I don't know I think oceanography sometimes I feel conflicted about it. I love the program so much that I came to school thinking I was going to be a creative writing

		major. And then I just decided to go with the science. And it's this would probably sum up the way I

		feel about like climate change and environmental science in general but I felt like I couldn't not do oceanography because I feel kind of like obligation to do something for the world you know to do like not and like a greater like I want to do some good but like for nature itself you know you know we came from nature I think it's important to like protect it and someone needs to give a voice to it." **P4:** (I am SOMEWHERE BEYOND HERE TATTOO) "I just feel like on a different level just of happiness and I like my problems feel smaller. And like you know like that's like proven like being in nature makes you a happier person. It's what my mom studies is like it's so important to like put yourself out there because that is who we are like we are nature we came from nature. Our development as a society like it's parallel to you know climate and everything around us." **P4:** "That was like here the sense of urgency like really began was like wow this is not something that's going to happen it's something that is happening and there's, there's something I can do about it. Hopefully, so." **Interviewer:** "Urgency, so beneath the urgency is there like fear anxiety or sadness or any of that? **P4:** Not really because I feel like fear anxiety and sadness comes from like worrying about yourself more. And I am like I said like I'm not fearful or anxious or sad about life without a human free Earth I'm not because I'm like a cynic anything like I love human humanity I think it's like beautiful and amazing. But I also know that like we've messed up royally and like we're looking at like whatever happens is going to happen. Yeah I don't like I'm going to try my best in my life to put research out there and get involved as much as I can to mitigate. But there's so much

		you can do. So yeah. I. Don't feel too sad or anxious or anything just passionate I guess." **P4:** (RELATES TO HARARI) "Yeah because I think climate shapes humanity… You know like the way the like the weather the weather's kind of like the more immediate term but the climate like shapes civilization." --- **Interviewer:** Credibility, connecting to others on the subject? **P5:** Making future change. **Interviewer:** Future change. **P5:** Making good policy. I feel like I have a role to play. Plus it's just inherently intellectually interesting. **Interviewer:** So you feel like you have a purpose then? You said "role to play", would you call that purpose? **P5:** Yeah, I'll call that purpose. --- **P6:** I actually went to Friday Harbor Labs to study marine zoology. And so that whole time I was like out among like, studying the ocean or like organisms like maritime stuff like walking around going into the forest collecting samples, that kind of stuff so it was a really cool way to kind of like just get away from like all the industrial like. Like societal norms and with the world and kind of get to a place we can really just focus on like what you really want to do. And I felt really. Connected to like the world and like everything around there. So it was really cool. **Interviewer:** So how does it feel for you emotionally? **P6:** Kind of like empowering almost because I found out that…because you always hear about how like the ocean's…screwed and that kind of stuff and you just like, well what if it's not because we're actually making the effort to do something about it. **P6:** It's kinda, it's kind of

		depressing. It's not like, not despair

		really because I understand that…there's always gonna be something we can do to make it better. **Interviewer:** So you have hope. **P6:** I always have hope. I wouldn't be in oceanography if I didn't have hope. --- **P7:** Some anger about it but there is optimism because there are companies like Tesla and men like Elon Musk that are trying to make a difference in wind farms and solar farms are spreading like I just saw an article today where in Istanbul there is a solar powered charging stations for people's iPhones and galaxies and stuff like that. So things are happening but I just feel like they're too small and too sporadic. But there is a trend going towards clean energy. **Interviewer:** So you have hope because of the trend the trends. **P7:** Yes. Before I came into this major I wasn't completely jazzed about physical therapy. We had to do observation hours as part of getting into grad school for it. I did those and I just didn't have a good time I didn't feel having a purpose there and then given my to the major at first I was like I don't know what I'm doing, I didn't know what the purpose is that I want to do. But after I was part of the natural history course we went over to lake Crescent and on the way back we drove through my hometown and after I learned about the native species that are supposed to be here seeing scotch broom, which I saw in my entire life, have run through it, I just realized it was like that's not supposed to be here. That should be gone. And it just was like what kicked me on to what I want to specialize in which is conservation slash restoration. So I believe that's my purpose. I

		want to repair ecosystems that we've changed through either direct action or inadvertent species that we didn't intend on coming because bilge

		water spews out a bunch of nonsense that it's not supposed to be here. **Interviewer:** And what's the sense of the emotion behind that for you? Like if you see that happening like the native species of birds being fed and... **P7:** I feel happy. --- **P8:** Seeing when I can actually impart something and I imagine is what probably all educators feel but for me in particular with the environment seeing when…folks are seeing the things that I see you start asking those questions, are inspired or…a fire has been lit under them for whatever reason and I like seeing that and…if I can steer them in…directions of understanding the climate change problem…then I've done my job. **Interviewer:** You feel like you've fulfilled your meaning purpose? **P8:** I've fulfilled my meaning and purpose if you can say 'I know what climate change is'. I know that it's real. I know that I have an ability to impact that with my actions. **Interviewer:** How does your work as an ES student tie into your meaning and purpose? **P8:** Helping to save the planet by helping people getting people on board, giving them information getting them excited. I think it's doing all of those things for me. I mean I felt that my enthusiasm and passion were always there, but what I was lacking until recently was the knowledge and how to disseminate that knowledge in a way that people will want it, won't turn away from it and will kind of take it and run with it. And it's given me all of the science that I can actually explain to people, you know, what is climate change, how is this bad, what does it really mean and what's really the cause of it. And before I wouldn't be able to

		tell you all those things that could give you what I might have picked up from the media I feel like it's

		not only just the foundation but it's also the pillars that's holding up everything that I'm wanting to do. **Interviewer:** OK so your education is kind of framing it and giving a foundation to it? **P8:** Right. **Interviewer:** Your passion and your meaning. **P8:** Exactly it's filling it out and making it better for me. **Interviewer:** Right and filling in blanks and giving you language. **P8:** Yes. Yes. **P8:** …it's getting more psyched, it's getting me more motivated I feel like it's putting more energy or I feel like I have more energy now in my senior year than I did when I was starting when I transferred or even when I left my career and went into school again. I feel like it's just powering me up. **Interviewer:** You feel empowered? **P8:** I do. I do. --- **Interviewer:** So what helps you when you start to feel kinda hopeless about things. What helps you to carry on in this study, this line of study in this line of work? **P9:** How it has passion. You know yeah I just have a real passion for it. I enjoy it. It makes me happy. Learning about it talking about it. Teaching other people about it. --- **Interviewer:** What brought you into this field of study? **P10:** Came to U-Dub, immediately environmental studies had some amazing teachers and stuck with it. Which put me ahead of the game and I was able to find my passion sooner than average **Interviewer:** How do you feel about the future of the human species the Earth itself and other life forms on Earth? **P10:** I think that question is very relative to the time frame and I have I'm very optimistic about the

		long term. I'm not sure that the human species will be nearly the same way it was but I don't think

		that I don't think that it's going to end the world. **Interviewer:** So how does it feel, what's the emotion behind that? **P10:** Hopeful. **P10:** I think when we understand things we're more equipped to make better decisions. --- **Interviewer:** So you feel hopeless, or? If you were to sum it up into a couple of words what, what would the feelings be? **P11:** I mean I currently feel hopeless, but... **Interviewer:** Ok **P11:** Hopeless slash maybe optimistic that we can do something. **Interviewer:** Ok, what helps to feed the optimism? **P11:** Seeing that there's other people that feel like me. **Interviewer:** Sort of like a collective of people that have likemindedness. **P11:** Yeah. **Interviewer:** What helps you carry on what keeps you driving in this work why do you keep doing it? **P11:** Because I think it's needed and I personally get replenishment from the environment so, even if it's hard I think I need to do it. **Interviewer:** So you're fighting for something you love it sounds like. **P11:** Yeah

APPENDIX E

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