ATHABASCA UNIVERSITY

CLIMATE EMOTIONS AND FUTURE-PLANNING AMONG CANADIAN ADOLESCENTS: CONNECTIONS TO EXISTENTIAL ANXIETY

BY

MATTHEW TREBLE, B.SC

A THESIS DISSEMINATION

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF COUNSELLING

FACULTY OF HEALTH DISCIPLINES

ATHABASCA, ALBERTA

OCTOBER, 2023

Athabasca University
Faculty of Graduate Studies

Approval of Thesis

The undersigned certify that they have read the thesis entitled

CLIMATE EMOTIONS AND FUTURE-PLANNING AMONG CANADIAN ADOLESCENTS: CONNECTIONS TO EXISTENTIAL ANXIETY

Submitted by

Matthew Treble

In partial fulfillment of the requirements for the degree of

Master of Counselling

The thesis examination committee certifies that the thesis
and the oral examination is approved

Supervisor:
Dr. Gina Martin
Athabasca University

Committee Member:
Dr. Murray Anderson
Athabasca University

External Examiner:
Dr. Daniel Rainham
Dalhousie University

December 11, 2023

1 University Drive, Athabasca, AB, T9S 3A3 Canada
Toll-free (CAN/U.S.) 1.800.788.9041 ex. 6821
fgs@athabascau.ca | fgs.athabascau.ca | athabascau.ca

Acknowledgments

I would like to deeply acknowledge and thank Dr. Gina Martin, my thesis supervisor, for her ongoing support throughout this entire process. She has been instrumental in helping me narrow down my ideas while also providing useful resources, sources, and supports to navigate writing this thesis. I would like to thank Dr. Alina Cosma for her support through the writing, editing, and publishing of the manuscript in Chapter 2. I would like to thank Tasha Roswell for her instrumental support in the data collection and analysis for this thesis. I would also like to thank Dr. Simon Nuttgens for his support in the early stages of developing the proposal for this thesis. As well, I would like to thank Dr. Murray Anderson for agreeing to be a member of my thesis committee. Finally, I would like to thank Cady Brockman, whose peer support throughout this entire process has been invaluable.

Abstract

The purpose of this thesis is to explore the emotional reactions and future-oriented thinking of children and adolescents in the context of climate change. Climate change is often referenced as an existential threat, yet this is under researched. 24 Canadian adolescents, aged 15 – 18 years, participated in online focus groups were conducted around the following discussion points: 1) the emotions Canadian adolescents are feeling in response to climate change; and 2) how or if climate change is impacting how Canadian adolescents think about their futures. An inductive (explorative) to deductive (theory-driven) thematic analysis methodology was used. 25 emotional responses and 11 themes surrounding how climate change is or is not impacting future-oriented thinking were identified. Existential themes appear to be an applicable framework to understand these experiences. Implications for mental health professionals who work with children and adolescents are discussed as well as recommendations for future research.

Keywords: young people, adolescence, eco-anxiety, climate change, climate crisis, existentialism, existential threats, mental wellbeing.

Table of Contents

List of Tables

List of Figures

Preamble

Thesis Structure

In this preamble I will discuss the overall structure of this thesis, the purpose of each Chapter, and relevant information pertaining to the manuscript-based approach of this thesis. This thesis is presented as a manuscript-based thesis wherein Chapters 2 and 3 represent manuscripts that are either currently published (Chapter 2) or in-progress (Chapter 3). Finally, Chapter 4 serves as a discussion and summary of the entire thesis.

Purpose of Chapters and Co-author Roles

Chapter 1 is an introduction to the topic and research within this thesis. I aim to provide a theoretical basis of existentialism, adolescent development, and the impacts of climate change on children and adolescents while emphasizing the importance of this topic within academic research. I have drawn upon a personal anecdote to frame the importance of this topic to myself and why I believe this is a relevant and timely topic for counselling psychology. It is important to note that I have taken a broad and encompassing approach to this Chapter in order to explore the topic in a larger scope. Due to this, future Chapters may have repetition as I explore these concepts in greater detail.

The second Chapter is a manuscript currently published in *Current Psychiatry Reports* Volume 25, published on June 24, 2023 (Treble et al., 2023). This narrative review explores the current state of psychological literature on children's and adolescents' psychological reactions to climate change. My role as lead author meant that

I led the conceptualization of writing, editing, and publishing of this manuscript. The co-authors on this paper were Dr. Alina Cosma and Dr. Gina Martin. My co-authors provided edits, suggestions to structure and flow, and support in sourcing more research and literature to reference. As well, Dr. Martin assisted me with navigating the publication process.

The third Chapter is an in-progress manuscript which is currently unpublished. This manuscript outlines the original research of this thesis including the background research, methodology, data analysis, results, and discussion. I am also the lead author of this manuscript. The data collection was part of a larger research project led by Dr. Martin and funded by the Social Sciences and Humanities Research Council titled *Canadian Adolescents and Climate Change: Negative Emotional Reactions and Coping Strategies*. As a member of the research team on this project, I contributed to the conceptualization by developing the future-oriented thinking question utilized within the online focus groups (Appendix B). Further, I was the lead facilitator on five out of seven online focus groups. For data analysis, I took a lead role in transcribing each focus group recording and designing the thematic data analysis process for my specific project. The collaborators I have worked with on this manuscript include Ms. Tasha Roswell and Dr. Gina Martin. Ms. Roswell is the project coordinator for the larger project and was the second coder throughout the data analysis process. Ms. Roswell and Dr. Martin facilitated the focus groups during data collection. Additionally, Dr. Martin has been a key editor.

The final Chapter is a discussion where I re-iterate and expand on key findings from Chapters 2 and 3, discuss the limitations of this thesis, explore implications for research, policy, and the counselling field, and discuss potential future research avenues.

Chapter 1: Introduction

1.1 Introduction

In this Chapter I will outline key concepts, the context of this thesis, theoretical grounding for this research, and the objective of this thesis.

1.2 Context

The inspiration for this research topic came from a conversation I had with an adolescent surrounding their concerns around having children. The person I was speaking with specifically mentioned being unsure if it was ethical to bring a new life into an uncertain world due to the projected future effects of climate change. The idea of ethics and future-planning really stuck with me, especially linked to climate change in the way it was presented. I undertook an independent literature review as part of a course for my Master's degree in which I attempted to explore this phenomenon deeper. In this review, I discovered that on a strictly theoretical basis there was seemingly overlap in existential theory and how researchers currently understand the impacts of climate change on emotional and mental wellbeing. These inciting incidents inspired the thesis you are reading. I approached this thesis with the belief that there may be existential underpinnings to climate change for young people that have not been fully fleshed out in current literature.

1.3 Key Terms and Concepts

There are some key terms that will be referenced throughout this thesis. In this section they are discussed, defined, and otherwise explained within the context they are utilized throughout this thesis and subsequent chapters.

1.3.1 Children and Adolescents

Childhood and adolescence represent developmental periods that are vital to understanding the novelty and importance of this research. The World Health Organization (WHO) loosely defines the age range of childhood as those aged 0 – 17 (World Health Organization, 2023). Further, the WHO defines adolescents as those within the age range of 10 – 19 (World Health Organization, 2016). Since there is overlap in these age ranges, they are often grouped together when talking about target demographics throughout the following chapters. Specifically, "children and adolescents" is referred to consistently in Chapter 2 and used to refer to the expansive age range, which was the target demographic for the narrative review, whereas only the term "adolescents" is used in Chapter 3. This is because Chapter 3's manuscript outlines primary research, and adolescents were the target demographic and age range of participants for this study.

Adolescence is a time of key biological, social, and psychological growth. The onset of puberty, social identity formation (who am I, who do I want to be, etc.), and intense fluctuations in emotional reactions are some examples of key aspects related to this developmental phase (this will be discussed in more depth later in this Chapter, section 1.4).

1.3.2 Climate Change

Climate change at its core references the changing climate Earth is experiencing largely attributed to human influence (Cook, 2022). Climate change, the climate crisis, and global warming are language often used interchangeably to reference this phenomenon of warming and long-term shifts in weather patterns of the Earth (United Nations, n.d.). There is a degree of climate change which is the result of natural causes, but the majority of its impact has been driven by human behaviour which has led to excessive carbon dioxide emissions into the atmosphere (Urry, 2015).

This gradual warming of Earth's temperatures due to excessive carbon dioxide emissions into the atmosphere is causing drastic and potentially irreversible damage (Pierrehumbert, 2019). There are predictions that suggest that without intervention, climate change at the rate we are experiencing it will reach a point where it is irreversible and will cause catastrophic weather events we are not prepared for (Masson-Delmotte et al., 2021; Thuiller, 2007). The consequences of climate change include increased frequency and duration of extreme weather events (e.g., heatwaves, flooding, cold fronts), physical health concerns to humans (e.g., malnutrition, poor air quality, food insecurity), and emotional/mental health concerns (e.g., feeling anxious, increased worry, psychological distress). The emotional/mental health concerns resulting from climate change, specifically climate change emotions, are key to this thesis.

1.3.3 Climate Emotions

Climate emotions reference the emotions or feelings that individuals may have when thinking about or experiencing climate change (Treble et al., 2023). There is established scientific literature that identifies a wide array of emotional responses to

climate change ranging from positive emotions, neutral emotions, to negative emotions (Galway & Field, 2023; Hickman et al., 2021; Martin et al., 2022). It is vital to recognize that climate emotions are not clinical mental health diagnoses, although terms like anxiety are often used, but rather emotional reactions to awareness or experiences of climate change (Clayton, 2020; Verplanken & Roy, 2013). The scope of these emotions will be explored discussed at length in both Chapters 2 and 3 through providing a snapshot of current literature surrounding these emotional experiences among children and adolescents (Chapter 2) and through qualitative research (Chapter 3).

1.3.4 Climate Anxiety

In recent years, terms like climate anxiety or eco-anxiety have been used to try and explain negative emotions in response to climate change. However, they do not have universal and operational definitions (Coffey et al., 2021; Helm et al., 2018; Hogg et al., 2021; Obradovich et al., 2018; Ogunbode et al., 2022). This may be partially due to the newness of this research field and that these are not clinical terms. Some researchers posit that climate anxiety is a broader term used to include any and all negative emotional responses to climate change (Ogunbode et al., 2022). I prefer this definition as it emphasizes the range of emotional reactions rather than implying climate anxiety is a clinical diagnosis or a component of clinical anxiety. Due to the broadness of this definition that allows for the inclusion of a variety of negative emotional experiences, climate anxiety will be used in the broadest sense of the term throughout the coming Chapters.

1.3.5 Existential Anxiety

Existential anxiety references anxiety symptoms, emotions, or responses, such as worry and stress, related to existential questions, themes, or threats. Existential questions, themes, or threats refers to anything that questions the meaning or purpose of human existence (Berman et al., 2006). This can be understood on an individual basis (i.e., what is the purpose of my life?) or on a larger scale generalized basis (i.e., what is the meaning of life? What is the purpose of humanity?). There are many ways an individual can experience existential anxiety, yet it is often linked to a discrepancy between one's authentic self and how they are living their life (Temple & Gall, 2018). These discrepancies can manifest as issues with meaning/meaninglessness, authenticity, or other existential themes (Davidov & Russo-Netzer, 2022; Spinelli, 2014). Existential anxiety will be referenced in coming Chapters to discuss the potential links between climate emotions and existentialism for children and adolescents. It is worth noting that, like climate anxiety, this is not a clinical diagnosis but a term used to recognize the impacts to emotional or mental wellbeing resulting from existential questions, themes, or threats.

1.4 Theoretical Grounding

The theories that ground this research are adolescent developmental theory and existential theory. As a reminder, adolescents are the sample population for this research. Therefore, adolescent development theory is relevant in understanding climate emotions during this life phase. A developmental understanding of adolescence provides insight to the psychological, physiological, and social aspects of adolescence as a distinct

demographic group (Belsky, 2019). Further, this theory helps contextualize what can be viewed as developmentally expected for adolescence in terms of mental health and wellbeing (Belsky, 2019). A developmental perspective is vital to further prioritize adolescents within these discussions as their developmental phase may leave them more vulnerable to negative effects from climate change (McGushin et al., 2022).

Existential theory is useful when considering the climate crisis as an existential threat (which this thesis aims to examine). By exploring the climate crisis as an existential threat, we can more fully explore the scope of how this threat is experienced by adolescents today. Finally, this section will explore a theoretical integration of both adolescent development and existential theory (section 1.4.3), specifically exploring how these two theories intersect.

1.4.1 Developmental Theory – Adolescence

There is no singular theory of adolescent development, rather there are an abundance of theories that serve to explain various components of biological, psychological, cultural, and social development and change an adolescent goes through during this time (Joerchel & Dreher, 2015). Two theories of adolescent development that are relevant to this thesis are G. Stanley Hall's (1905) biogenetic theory of adolescent development ("Storm and Stress") and psychosocial theories of identity formation (McLeod, 2013; Schwartz et al., 2013). These theories are used in this thesis as conceptual foundation as they help explain expected outcomes and trajectories of adolescent development. Further, this allows hypotheses to be made based on the existing literature documenting how climate change is impacting the emotional and mental wellbeing of adolescents.

Hall's theory discusses emotional reactions of adolescents and frames it within the context of biological and social influences (1905). Specifically, Hall argued that adolescents experience both extreme emotional highs and extreme emotional lows when compared to children and adults (Hall, 1905). Arnett (1999) shares that this specific component of his theory has stood the test of time. This is further supported by Bailen et al. (2019) who conducted a review of emotional experiences for adolescents and found that modern adolescents appear to be experiencing these emotional extremes as well.

While Hall focused his theoretical assumption on the influence of puberty and hormones, other researchers argue that psychological, social, and cultural influences need to be considered as possible variables to explain these emotional disruptions (Arnett, 1999; Bailen et al., 2019). The emphasis on emotional reactions in adolescence is important for understanding that some adolescents may already be prone to intense emotional responses, which can be compounded with the influence of climate change.

There is not a singular psychosocial theory of adolescent development, so concepts under this umbrella of theoretical perspectives will be discussed. Psychosocial theories of adolescent development stress the importance of identity development and how this relates to preparing for assuming mature adult roles (Schwartz et al., 2013). This can be further elaborated to explain that one of the theorized primary purposes of adolescence is to resolve internal conflicts in preparation for entering the adult world (Schwartz et al., 2013). Psychosocial theories of adolescent development provide a framework to understand how the interactions of one's psychological and social factors contribute, or impact, individual development (McLeod, 2013).

For adolescents, there are many psychosocial perspectives that offer insight or ideas on what is occurring developmentally during this timeframe. For example, socially, adolescents often want to establish themselves as an individual while also establishing their belonging to a group or groups. This is often done through hypothesizing what their role, job, or purpose will be in adulthood (Branje, 2022). This is often manifested by the age-old question "what do you want to be when you grow up?" Since adolescents are largely trying to conceptualize their place in the world as they transition to adulthood, it is important to consider the importance adolescents place on future-oriented thinking and planning as well as how this may or may not be impacted by climate change. As an example, if an adolescent is spending lots of time considering what career they want to pursue in adulthood, they may experience additional stress while contemplating if that career will be impacted by climate change in the future.

For another example, McGushin et al. (2022) highlight how the concept of adolescent development exists in the context of climate change. They emphasize agency and resiliency as two major components of adolescent development that are crucial to the developmental processes of adolescences (such as identity formation) that are threatened by climate change through the powerlessness some feel within this issue. Agency and resiliency are concepts that directly show how adolescents are trying to develop their sense of self, which ties in with the theories discussed above outlining the struggles adolescents face trying to develop their identities towards their future adulthood (McGushin et al., 2022; McLeod, 2013; Schwartz et al., 2013).

1.4.2 Existential Theory

Existential theory originates from philosophical and ethical theories pertaining to life and existence. Existential psychology largely stems from philosophical contributions dating back to the 1800s, but it was largely amalgamated into what is now known as existential theory in the 1940s and 1950s in Europe as a result of the impacts of World War II and the existential issues that arose from that (Zieske, 2020). Some key philosophers who contributed to the conception of existential theory are Soren Kierkegaard (contributed concepts of guilt, nothingness, despair, and fear within existential contexts), Friedrich Nietzsche (contributed concepts of death, free will, and suicide), Jean-Paul Sartre (contributed concepts of meaninglessness, individual responsibility, and the importance of choice), and Martin Heidegger (contributed concepts of individual responsibility, isolation, and meaninglessness) (Reynolds, 2014; Zieske, 2020). All of these concepts directly relate to the foundation of existential theory, which is to help human beings process meaning, mortality, finality, and the uncertainness of life. From this, existential psychology was founded to explore such existential concepts in the context of the individual psyche and mental wellbeing (Jurica et al., 2014).

Under the larger umbrella of existential theory is existential anxiety, a concept briefly explored earlier in this Chapter. Existential anxiety is conjectured to arise for people who are actively aware of existential concepts but who are also struggling to find comfort or peace with them and therefore feel unsettled or anxious about some aspect of existence. This is often seen when providing counselling for people who feel anxious about mortality, fate, or death (Adams, 2014). When an individual experiences internal

conflict between their sense of self and one of these key concepts, this is deemed an existential conflict.

It is possible for people to have existential conflicts without existential anxiety; but, when feelings of anxiety and distress from existential conflicts are beyond the individual's ability to cope this can be considered existential anxiety. Therefore, any disparities between this drive for meaning and purpose and one's authentic beliefs and thoughts creates existential conflict or anxiety for said individual (Adams, 2014; Correia et al., 2017). When an individual experiences disparities between their authentic self and concepts like freedom, mortality, and meaning(lessness), then they may struggle with existential conflict and/or anxiety (Correia et al., 2017; Frankl, 2014). Existential therapies exist to support people experiencing this. Such therapies operate on the assumption that by supporting people through these conflicts, struggles and negative feelings will be alleviated or mitigated (Correia et al., 2017; Frankl, 2014).

1.4.3 The Intersection of Adolescent Development and Existential Theory

Some research has linked adolescents' experiences of existential concerns or anxiety to their identity formation (Berman et al., 2006; Maxwell & Gayle, 2013). Berman et al. (2006) found that rates of existential anxiety amongst young people were linked with struggles with individual identity. They further hypothesized that thoughts and conflicts related to identity, future roles, responsibilities, values, and goals may provide insight into bigger existential questions and concerns that are key to this developmental phase. This is in alignment with the notion that aspects of identity development are intrinsically linked to existential themes, and inconsistencies with identity development can compound symptoms associated with existential anxiety at

adolescence (Berman et al., 2006). Maxwell & Gayle (2013) also argue that the core of adolescent development is existential in nature. They posit that the larger search for identity and the attempt to answer the timeless question 'Who am I?' is directly existential as it suggests a higher order thinking relating to one's place within life. This type of thinking is characteristic of adolescence both developmentally and socially and thus further exemplifies the overlap between existential theory and adolescent developmental theory.

1.5 Establishing Relevance and Importance of this Topic

The prior sections of this Chapter serve to establish a theoretical and conceptual foundation of knowledge that help situates the current research presented in this thesis. It has already been established that children and adolescents are a key demographic that will be discussed throughout this thesis as well as that there is theoretical overlap between adolescent development theory and existential theory. However, it has not yet been fully discussed as to *why* children and adolescents are vulnerable to the impacts of climate change on an emotional and mental health level.

The issues of climate anxiety, climate emotions, and climate change's overall impact on wellbeing are indiscriminate to age. Yet, children and adolescents are particularly vulnerable to these effects due to the uncertainty it can create surrounding their futures (Treble et al., 2023). Adolescent development is a developmental phase where those within the age range are often turning to the future as they envision who they want to become within their lives and society. When the future is additionally uncertain due to climate change, this process becomes even more challenging.

Climate change research that specifically looks at psychological impacts is a newer and growing field (Martin et al., 2023). Within this growing field, there is a smaller subsection of research specifically focused on children and adolescents (see Martin et al., 2022; Ojala et al., 2021 for reviews). This is a well identified knowledge gap that researchers are using as a call to action to encourage academics to focus research on younger populations so we can continue to understand how climate change may or may not impact the emotional and psychological wellbeing of children and adolescents. A sense of urgency is required in these discussions since there is much we do not know, yet climate change impacts continue to worsen. Mental health professionals and academia both need to be aware of, and prioritize, understanding and supporting children and adolescents as they navigate a climate change-stricken world.

1.6 Relevance to the Counselling Field

I am approaching this thesis from the perspective of a graduate student pursuing a Master of Counselling degree while also working as a youth mental health counsellor for the past four years. The anecdote I shared in this Chapter's introduction is an experience I had within my role as a youth mental health counsellor. I mention this as it is a direct link to demonstrate how the issue of climate change and its impact on children and adolescents is showing up in counselling sessions already, and to further illustrate the necessity for the counselling and mental health fields to create targeted and specific approaches to help address these issues. The American Psychological Association supports this through an article published that identifies how climate change is a mental health concern which specifically highlights how it is a concern for children and young

people (Clayton et al., 2017). Other recent studies, such as that of the Royal College of Psychiatrists (2020) in the United Kingdom state that over 57% of psychiatrists who work with children and adolescents in England are reporting working with individuals experiencing climate change related distress.

An existential lens to psychotherapy could address many of the unique factors currently present with climate change. Many evidence-based practices of existential therapies already exist within the field of counselling psychology (Henson, 2017; Ramsey-Wade, 2015; Spinelli, 2014; Vos et al., 2015). If key elements of existentialism, specifically values and meaning, emerge when examining adolescents' emotional experiences of climate change, then one can begin to explore other therapeutic avenues that may show promise in supporting children and young people.

1.7 Summary

Climate change poses a unique and complicated problem for humanity. Children and adolescents are particularly vulnerable to negative or unpleasant emotional and mental effects resulting from climate change. While research is growing within this field, there is a noticeable lack of research on children and adolescents within this context. This is a relevant issue to the field of counselling psychology as many counsellors, therapists, and mental health professionals may work with young clients are experiencing these issues firsthand. This thesis will build upon this identified knowledge gap by providing a narrative review of the current literature (Chapter 2) and a primary research project on climate change emotions and future planning for adolescents (Chapter 3).

Chapter 2. Child and Adolescent Psychological Reactions to Climate Change: A Narrative Review Through an Existential Lens

2.1 Abstract

This Chapter is in published form at Current Psychiatry Reports (Treble et al., 2023). Reproduced with permission from Springer Nature (Appendix A).

2.1.2 Purpose of review:

A narrative review on research surrounding children and adolescents' experiences of emotions and mental health in relation to climate change also exploring potential connections to existential anxiety.

2.1.3 Recent findings:

Children and adolescents represent one of the most vulnerable groups in relation to experiencing negative mental health impacts due to climate change. This population reports a wide range of emotions in relation to climate change, with most research reporting on worry and anxiety. Previous studies explore associations between these emotions and mental health, however, findings vary across studies. Although important contributions were made in recent years, important gaps remain. Additionally, an existential underpinning to these experiences has been suggested.

2.1.4 Summary:

An understanding of the psychological and emotional reactions children and adolescents have in relation to climate change is needed. This may be supported by an existential framework.

2.2 Introduction

Climate change, at its core, is a threat to our planet and all life on it. Excessive carbon dioxide emissions from human behaviour are causing increased temperatures across the planet which is currently having, and will continue to have, impacts on all life on earth (Pörtner, 2022). Research shows that climate change impacts both the physical and psychological health of humans; but until recently there has been little focus on psychological effects. In recent years there has been an uptick in the recognition that mental health and emotional wellbeing are impacted by climate change; this recognition has been met with several reviews that seek to summarize existing evidence and theorize on the influences this is having on children and adolescents (Burke et al., 2018; Hayes et al., 2018; McGushin et al., 2022; van Nieuwenhuizen et al., 2021). Broadly, the impacts of climate change on mental health and emotional wellbeing can be conceptualized through a framework that categorizes the effects into direct, indirect, and overarching, (Hayes et al., 2018) and has since been utilized in other reviews (see Lawrance et al., 2022 and Martin et al., 2022 for reviews). Direct effects are the impacts on the mental health and emotional wellbeing of people who experience acute climate change related events, such as extreme weather events. Indirect effects refer to changes that are more indirect in nature, such as shifting societal structure or impact on education and employment. Finally, overarching effects refer to psychological reactions that occur from a general awareness of the threat of climate change to the planet and life on it (Hayes et al., 2018).

Children and adolescents are a key population who are projected to experience the effects of climate change to a greater degree than previous generations (McGushin et

al., 2022; Thiery et al., 2021; World Health Organization, 2021). Many reviews and commentaries highlight that children and adolescents are experiencing climate change as an existential threat (Budziszewska & Jonsson, 2021; Guthrie, 2023; Lawrance et al., 2022; Martin et al., 2022; Nadarajah et al., 2022; Ojala et al., 2021) indicating that climate change is a complex and distinct phenomena in how it can impact mental health and emotional wellbeing. Despite this, the existential nature of climate change is not thoroughly discussed or evaluated. Accordingly, this narrative review aims to provide an updated snapshot of new developments within academic research focusing on child and adolescent mental health and emotional wellbeing in the context of climate change. Additionally, a more robust exploration of climate change as an existential threat for this population, is presented.

2.3 Children and Adolescents: A Key Population

Children and adolescents are facing the realities of climate change while going through major developments to their overall physical and cognitive systems (Ma et al., 2022; A. Sanson & Bellemo, 2021; A. V. Sanson et al., 2019). Additionally, children, and more specifically adolescents, are at a key phase of self-discovery and establishing a sense of self (McLeod, 2013; Schwartz et al., 2013; Vergunst & Berry, 2022). While establishing a sense of self, young people often look to the future and consider what an idealized self might look like (McLeod, 2013). Climate change can create uncertainty towards the future thus creating challenges when envisioning such futures.

Another consideration is that this population has limited power compared to adults, who are in positions of authority within institutions (Skovdal & Benwell, 2021). It

has been theorized that hopelessness among children and adolescents may stem from such feelings of powerlessness in the context of climate change (A. V. Sanson et al., 2019; Skovdal & Benwell, 2021). Despite this, many young people are engaging in activism to have their voices heard and showcase the importance of climate change to them and future generations (Gasparri et al., 2022; Godden et al., 2021). Climate strikes and marches have taken place worldwide, and are often led by, and comprised of, children and adolescents. For the reasons outlined this demographic is a priority for research and practical considerations so that we can best support young people as they grow and develop while facing a changing climate.

2.4 Climate Change and Child and Adolescent Mental Health and Emotional Wellbeing

2.4.1 Direct Effects

Studies have found that experiencing extreme weather events can lead to experiences of stress and mental health concerns, such as posttraumatic stress, trauma, anxiety, and depression, as well as a sense of grief and loss (Chen et al., 2020; Lawrance et al., 2022; Morganstein & Ursano, 2020; Obradovich et al., 2018). Children and adolescents who experience a *singular* extreme weather event have been shown to have mental health consequences, such as increased suicide rates, posttraumatic stress, and depression, but concerningly with repeated exposure to extreme weather events this is exasperated (Lawrance et al., 2022; van Nieuwenhuizen et al., 2021). Experiences of extreme weather events can also lead to increased negative emotions, such as worry fear, and anxiety, about the changing climate (Bratu et al., 2022; Ojala et al., 2021).

Although the impacts on mental health and emotional wellbeing from experiencing extreme weather events can vary by type of event and socio-demographic characteristics, it is agreed upon that in general children and adolescents are at an increased risk to these negative impacts (Lawrance et al., 2022). As extreme weather events are projected to increase in frequency and duration (Pörtner, 2022) more work is needed to understand how these effects vary by type of extreme weather event, and to look for effective strategies on how to best protect and promote the mental health of this population when facing such events.

2.4.2 Indirect Effects

The indirect mental health effects of climate change on children and adolescents can be understood by considering the mental health and emotional wellbeing impacts that occur from experiences of familial or community separation, food security, impacts on livelihoods, forced migration, and disruption to education (Lawrance et al., 2022; McGushin et al., 2022). These experiences can all stem from climate change, whether it is through the lasting impacts of an extreme weather event or from more gradual environmental changes that influence the daily living conditions of young people. One specific indirect effect that is worthy of more attention is the potential for changes to the school environment, as this is a central environment for the learning and development of children and adolescents. For example, children may have less access to outdoor recess/social time or schools may be temporarily closed due to factors like heat waves and flooding, this could have indirect effects on their mental wellbeing through reduced independent play/social time and time for structured learning (Button & Martin, 2023). Additional evidence pertaining to how indirect effects impact young people is an area

where more research is needed, there is currently not enough empirical research to fully understand how these indirect effects are experienced being by children and adolescents.

2.4.3 Overarching Effects

Overarching effects relate to emotional distress stemming from an awareness of climate change and the threat it poses to the planet, without necessarily experiencing an acute event or more gradual change (Burke et al., 2018). It is important to note here, that negative emotional responses to an awareness of climate change are rational and can even be adaptive in processing the larger context of climate change and motivating for action. However, these emotional experiences could also become overwhelming for some. An area of emerging research is how emotional wellbeing is associated with more generalized mental health. Therefore, to avoid conflating the two separate experiences and prevent pathologizing the emotional reactions children and adolescents are having to climate change, in this review we adopt a similar approach to Lawrance et al. (2022), in that negative emotions in relation to climate change will be discussed in a separate sub-section from the research that looks at emotional wellbeing associations with generalized mental health.

2.4.4 Emotions in Relation to Climate Change

New terms like *eco-anxiety* or *climate-anxiety* have been introduced to give name to climate-specific negative emotional experiences; such terms do not have an universal, agreed upon operational definition and are *not* a clinical diagnosis (Coffey et al., 2021; Helm et al., 2018; Hogg et al., 2021; Obradovich et al., 2018; Ogunbode et al., 2022; Reyes et al., 2021; Stanley et al., 2021). An example of discourse is provided by Ogunbode et al. (2022) who suggest *climate anxiety* is broad and encompasses all the

negative emotions in relation to awareness of climate change, whereas *eco-anxiety* is defined by anxiety symptoms felt related to climate change (Pihkala, 2020). Despite that an agreed upon definition is yet to be established, the emergence of such terms and their uptake in media (DuLong, 2022; Gregory, 2021; Rachini, 2022) and popular culture (Grose, 2020; Ray, 2020; Wray, 2022) highlights that negative emotions stemming from climate change awareness represents a distinct, contemporary societal phenomena.

There is a wide array of emotional experiences children and adolescents report due to climate change. Feelings of *worry* and *anxiety* are the most prevalent emotions reported in cross-sectional studies of children and adolescents (Brophy et al., 2022; Clayton et al., 2023; Galway & Field, 2023; Hickman, 2020; Hickman et al., 2021; Léger-Goodes et al., 2022; Martin et al., 2022; Sciberras & Fernando, 2022; Verplanken et al., 2020). Hickman et al. (2021) conducted a survey of 10,000 people aged 16 – 26 in ten countries and found 61.8% reported anxiety about climate change and almost 60% reported feeling either "very" or "extremely" worried about climate change. Similarly, among 1,000 Canadians aged 16 – 26 it was found that 65% reported feeling anxious about climate change (Galway & Field, 2023). In a UK sample of 16-18-year-olds, similar results were found with 68% of the sample feeling anxious and 68% feeling worried (Finnegan, 2022). A longitudinal study on Australian 10 – 11-year-olds over the course of eight years (to age 18/19) highlighted that from childhood to adolescence 24.9% of participants experienced consistent moderate worry and 24.3% experienced increasing worry over the course of the study (Sciberras & Fernando, 2022). The above recent studies showcase that anxiety and worry are being reported by a substantial proportion of today's children and adolescents worldwide.

While the most commonly discussed emotions in recent reviews and empirical research are worry and anxiety (Lawrance et al., 2022; Martin et al., 2022; Ojala et al., 2021), there are other emotions that children and adolescents are reporting. In their global survey, Hickman et al. (2021) also found that 67% of the sample of 16 – 26 year old young people reported feeling afraid, 67% sad, 56% powerlessness, 51% helpless, and 42% grief. Similarly, Galway and Field (2023) note that 66% of Canadian adolescents reported feeling afraid, 65% sad, 58% helpless, 56% powerless, and 34% felt grief. Their study also reported rates of anger, guilt, ashamed, despair, and hurt, although the prevalence of these emotions were not reported. Similarly, UK adolescents (aged 16 – 18-years-old) reported feeling frustration (67%), anger (58%), and fear (57%) (Finnegan, 2022). Another study looked at an older sample of adolescents and emerging adults in the US (aged 18 – 21) and Finland (aged 21 – 31), and found that across both populations anger, grief, and guilt were commonly felt, as well as feeling overwhelmed and powerless (Coppola & Pihkala, 2023). These recent studies serve to emphasize the diversity of negative emotional experiences experienced globally.

Although negative emotions have been found to be the most prevalent, children and adolescents also report positive emotions like optimism and hope (Finnegan, 2022; Galway & Field, 2023; Hickman et al., 2021). Among Canadian adolescents 21% reported feeling optimism (Galway & Field, 2023). While in a survey of ten countries, it was found that 31% of participants felt optimism (Hickman et al., 2021). For hope, Finnegan (2022) reported that 94% of an adolescent sample from the UK scored as 'slightly hopeful' or higher on a Climate Change Hope Scale. Optimism and hope can potentially serve as adaptive responses for children and adolescents by supporting action;

however, more research is need to understand how both positive and negative emotions relate to coping strategies, which may include both de-emphasizing the issue or alternatively motivating one to take action (Galway & Field, 2023; Ojala, 2012).

The above studies demonstrate the complex array of emotions being experienced by children and adolescents, of note, the majority of empirical studies are focused on adolescents (aged 16 and up) rather than children and younger adolescents, emphasizing a need to prioritize younger populations in future research.

2.4.5 Associations Between Emotions about Climate Change and Mental Health Outcomes

An emerging area of research is examining if the negative emotions that people are reporting are associated with more general mental health outcomes (e.g., generalized anxiety, depression, posttraumatic stress, psychological wellbeing). One study examining Filipinos (aged 18 – 26 years old) found that climate change anxiety, measured by the Climate Change Anxiety Scale, was significantly negatively correlated with generalized mental distress, measured by the Mental Health Inventory – Psychological Distress, but not overall wellbeing, measured by the Mental Health Inventory – Psychological Wellbeing, although the authors note they did not account for potential confounding variables (Reyes et al., 2021). Another study of Norwegians (aged 13 – 19 years) old identified that worry was associated with depressive symptoms, as measured by the Depressive Mood Inventory, lower subjective wellbeing, and lower expectations of having a happy life (Leonhardt et al., 2022). Hickman et al. (2021) found a significant positive correlation between worry and negative functional impacts on daily life due to concern about climate change for adolescents across several countries. Functional impact

is not inherently a mental health outcome but could provide valuable insight into a broader mental wellbeing state. Galway and colleagues' (2023) study asked a sample of Canadian adolescents to self-assess the impact they felt climate change had on their mental health; 78% felt climate change impacts their overall mental health and 37% acknowledged feeling like climate change impacts their daily life.

While the research discussed in this sub-section thus far has been cross-sectional, a longitudinal study of Australian children and adolescents did find a significant connection between those who reported high levels of persistent worry from ages 10/11 to 18/19 (13% of their sample) and depression symptoms when compared with those reporting consistent moderate worry. Their study did not find any other significant associations between depression symptoms and the other reported trajectories of worry about climate change. Although some studies suggest a causal relation between certain negative emotions and mental health outcomes there is not enough evidence to fully support such claims as most work is cross-sectional and directionality cannot be readily determined. Recent reviews also discuss potential associations between emotions and mental health outcomes for children and adolescents and highlight that associations could be bi-directional or due to key confounding variables, such as higher overall propensity to worry (Ojala et al., 2021). Future research is needed to examine the complexity of such relationships and if so, if they vary for different emotions (e.g., worry, frustration, anger) and mental health outcomes (e.g., depression, anxiety, flourishing).

2.5 Situating the Knowledgebase

While there is a distinct difference between experiencing negative emotions and having mental health problems or low levels of mental wellbeing, children and adolescents experiencing negative emotions in relation to climate change still may want or need support to deal with these potentially difficult emotions. Therefore, it is important to validate their emotional experiences in relation to climate change and offer appropriate support to help them navigate any difficult emotions they are feeling (S. D. Clayton et al., 2023; Diffey et al., 2022; Hickman et al., 2021). Although terminology is evolving as research on the topic expands, having shared language within academia, practice, and the lived experiences of those affected can potentially be validating in that it can normalize the emotional responses to climate change so that young people do not feel alone in this experience (J. Thomas & McDonagh, 2013); however, at the same time we must also be cautious not to pathologize understandable emotional responses (Diffey et al., 2022).

Framing climate change as an existential issue has the potential to help contextualize the negative emotions stemming from climate change awareness without pathologizing them. By grounding climate change in existential theory, we can provide a framework that posits these emotional experiences as rational to the existential threat of climate change. Guthrie (2023) advocates for the recognition that emotions, such as anxiety, in relation to climate change are not only rational, but need to be accepted in order to begin processing the existential threat of climate change. Further, this framework could also help children and adolescents experiencing direct and indirect effects of climate change. This review has already established the potential of emotional or mental

health outcomes for young people from direct and indirect effects, an existential lens could further help them process and understand their emotional reactions to living through these experiences.

2.6 Climate Change as an Existential Issue

Given that climate change is projected to have an impact on every aspect of children's and adolescents' lives, it is often viewed as an existential threat. Despite this, research has yet to specifically explore these potential mechanisms and links (Budziszewska & Jonsson, 2021; Lawrance et al., 2022; Ma et al., 2022; Ojala, 2016; Ojala et al., 2021); however some do suggest that living through an existential threat can be a contributor to both psychological or emotional distress (Budziszewska & Jonsson, 2021; Ojala et al., 2021). Understanding climate change as an existential issue could be useful for the following reasons: 1) it allows researchers to recognize some potential underlying mechanisms that may be contributing to the negative emotions children and adolescents are experiencing; 2) it acknowledges the reality of the threat that climate change is, thus validating why this is such an impactful issue for children and adolescents; and 3) this framework can help inform professionals in creating targeted mental health supports for children and adolescents, drawing upon the evidence-based practices of existential therapy and theory (Budziszewska & Jonsson, 2021; Guthrie, 2023; Ojala, 2016).

Climate change can be viewed as an existential threat as it threatens the future of humanity and brings with it a sense of uncertainty, since it cannot be truly predicted the exact scope climate change will have on humankind. Climate change can leave people

with questions about mortality and meaning which provide insight into the underlying mechanisms of some of the existential concerns that stem from climate change (Butler, 2018). There has been empirical research exploring the role of meaning-focused coping for children in the context of climate change (Ojala, 2012, 2013). This form of coping has been directly referenced as drawing upon the existential understanding of meaning, which is tied to individual values and morals (Ojala, 2012). Since climate change is ongoing and threatens human perceptions of life, an approach that acknowledges an existential understanding is needed to appreciate the scope of psychological reactions of children and adolescents to climate change (Butler, 2018; S. Clayton, 2020).

The domains of existential anxiety may provide insight into some underlying mechanisms of emotional wellbeing and mental health concerns stemming from climate change. Table 1 gives the domains of existential anxiety and draws comparisons to climate change related emotional wellbeing and mental health topics as discussed in recent literature.

Some emerging studies support the underlying link between existential anxiety and emotional wellbeing and mental health experiences in relation to climate change. For example, during semi-structured interviews with adolescent and adult psychotherapy patients (18 – 49 years old) who self-reported experiencing climate anxiety, existential themes were present, suggesting a link between these phenomena (Budziszewska & Jonsson, 2021). Another study of adult participants suggested that existentialism is an appropriate conceptualization to understand the emotional distress experienced by the participants related to climate change (Rehling, 2022). These results indicate a need for

further research to see if the inclusion of an existential perspective, could benefit those struggling with difficult psychological responses to climate change; research that looks at younger populations is warranted.

Table 2.1

Comparison of Themes Between Existential Anxiety and Emotional and Mental Health Related to Climate Change

Domains	Perspective	
	Existential (Scott & Weems, 2013; Spinelli, 2014)	Emotional and Mental Health Related to Climate Change
Emptiness and Meaninglessness	The changes or loss experienced once previously held conceptions (worldviews, beliefs, identities) no longer hold the same meaning and the internal struggle of feelings of loss of significance towards life itself (Budziszewska & Jonsson, 2021; Scott & Weems, 2013).	Climate change creates a shift in understanding that impacts one's life or their place within life through confrontation of mortality (Guthrie, 2023). Many people experience changes in worldview in response to climate change.
Guilt and Condemnation	The lack of congruence between personal morals and personal behavior (Budziszewska & Jonsson, 2021; Scott & Weems, 2013).	Guilt is an emotion that some children and adolescents are experiencing in relation to climate change, often tied to individual guilt towards climate change or collective guilt towards inaction (Coppola & Pihkala, 2023; Galway & Field, 2023; Hickman et al., 2021).

Fate and Death	The reminder of one's mortality and how one's fate is undecided while navigating through life (Budziszewska & Jonsson, 2021; Scott & Weems, 2013).	The uncertainty that climate change creates links to uncertainty around one's fate, while it is also thought that for some climate change can amplify one's awareness of death and mortality for young people (Baudon & Jachens, 2021; Burke et al., 2018; Butler, 2018; S. Clayton, 2020; Skovdal & Benwell, 2021). Guthrie (2023) specifically argues that eco-anxiety is linked to death anxiety.

Existential anxiety has been addressed through therapeutic approaches that are specifically designed to support individuals experiencing existential anxiety or other existential-related issues, such as existential therapy and Acceptance and Commitment Therapy (Henson, 2017; Ramsey-Wade, 2015; Vos, 2016; Vos et al., 2015). Existential therapies often focus on understanding the meaning the clients holds through identifying their personal values and morals, and Acceptance and Commitment Therapy prioritizes a values-based approach as well (Ramsey-Wade, 2015; Vos et al., 2015). It has been demonstrated in empirical research that children who use meaning-focused coping, to deal with climate change worry also have greater positive general affect (Ojala, 2013). Such approaches could potentially be beneficial in supporting children and adolescents experiencing negative emotions, or mental health problems related to climate change through the prioritization of meaning- and values-based coping strategies, although promising much more research on this topic is needed.

2.7 Implications for Research and Practice

This review has identified contemporary knowledge gaps that could be addressed in future research; specifically, a need for more research centring younger adolescents and children and research exploring existential links to the perception of climate change for this demographic. Future research could also focus on adapting existing therapeutic strategies and interventions to reflect the emotional wellbeing and mental health problems children and adolescents are experiencing related to climate change. In this review, we briefly discussed the benefits of Acceptance and Commitment Therapy and existential therapies as potential therapeutic supports for children and adolescents. Future approaches that apply pre-existing knowledge of these therapies and strategies to work with children and adolescents impacted by climate change could be developed and tested for efficacy.

2.8 Conclusion

This review captures a snapshot of current research focusing on children's and adolescents' emotional and mental wellbeing in the context of climate change. It is worth noting that it has been established that there is a gap in empirical research focusing on children and adolescents, this review identified a further gap in recent empirical research on younger adolescents and children. Most of the studies published on this topic use cross-sectional data, thus highlighting a need for more longitudinal studies exploring these phenomena and trends. We identified that many studies and reviews make mention of climate change as an existential threat, yet this had not been fully explored. By comparing the domains of existential anxiety to the literature on emotional wellbeing and

mental health and finding commonalities we suggest such a link exists, and that this may be a lens to help understand underlying cognitions and mechanisms. An existential framework could also be used to inform future research and professional practice to help support children and adolescents experiencing these challenges to emotional wellbeing and mental health.

Chapter 3. Canadian Adolescents' Emotional Responses and Future Planning in the Context of Climate Change

Note: This Chapter is written in manuscript form with a planned submission to Global Environmental Change Advances.

3.1 Introduction

In this Chapter I will outline the methodology, data analysis, results, and discussion for qualitative research conducted as part of this thesis. The consolidated criteria for reporting qualitative research (COREQ) guidelines (Appendix C) were used in the reporting of this study to ensure all relevant and valuable information is presented transparently. This Chapter discusses the current research (sections 3.3 – 3.5) while integrating prior literature (sections 3.2 and 3.6), building upon the growing knowledge base of climate change and emotional wellbeing for adolescents.

3.2 Background

Research exploring how climate change impacts the mental and emotional well-being of adolescents has become more prevalent in the last five years (Burke et al., 2018; Galway & Field, 2023; Hickman et al., 2021; Martin et al., 2022; 2023; McGushin et al., 2022; Ojala et al., 2021; van Nieuwenhuizen et al., 2021). Recent quantitative studies based on surveys report a range of emotional responses to climate change experienced among today's adolescents with most research reporting on feelings of anxiety and worry. For example, in a sample of 10,000 young people (aged 16 – 26 years-old) from ten countries 60% reported feeling "very" or "extremely" worried about climate change and 62% answered "yes" to feeling anxious about climate change (Hickman et al., 2021). Amongst 16 – 18 year-olds from the UK, 68% reported worry and 68% reported feeling anxiety towards climate change (Finnegan, 2022). A study of 1000 Canadians aged 16 – 26 years-old reported that 65% of the sample felt anxiety towards climate change (Galway & Field, 2023). In an eight year longitudinal study of Australian children and adolescents, 25% reported consistent moderate worry as well as 24% reported feeling increasing worry between the ages of 10-11 and 18-19 (Sciberras & Fernando, 2022).

Although anxiety and worry are the most studied emotions about climate change among young people (Martin et al., 2022; 2023; Treble et al., 2023), other emotions about climate change are reported by youth and adolescents. Galway and Field (2023) as well as Hickman et al. (2021) report additional emotions including feeling afraid (66% and 67%, respectively), sad (65% and 67%, respectively), powerlessness (56% and 56%, respectively), helpless (58% and 51% respectively), and grief (34% and 42%,

respectively). Whereas Finnegan (2022) reports emotions including frustration (67%), anger (58%), and fear (57%).

Recent qualitative research has also explored this topic for children and adolescents (Busch & Ayala Chávez, 2022; Léger-Goodes et al., 2023; Thomas et al., 2022; Thompson et al., 2022). A study by Busch and Chávez (2022) used open-ended survey questions for middle- and high-school students in the Western United States and found that those who used psychologically near framing (thinking about how climate changes impacts people, plants, animals) reported more feelings of concern compared to those who used psychologically distant framing (thinking about how climate change impacts global systems, the planet itself). Another study that conducted semi-structured focus groups for 39 American and 35 French children and adolescents, aged 7 – 18, found that participants reported a range of feelings about climate change, including anger, hopelessness, sadness, anxiety, guilt, and frustration (Thomas et al., 2022).

Further, Léger-Goodes et al. (2023) utilized a sample of Canadian parent-child dyads from Quebec (children participants were between the ages of 8-12) using open- and close-ended survey questions with thematic analysis and content analysis methodology to discover that unpleasant feelings of sadness (towards ecological loss and animals), anger, frustration, disappointment, anticipation (including anxiety, stress, and feeling overwhelmed), fear, and uncertainty towards their futures were present for the children. In addition to these unpleasant feelings, more positive feelings of gratitude (in not experiencing climate change yet) and pride in taking climate-positive actions were also identified. An interesting finding this study reports is that there is seemingly no pattern between parental worry about climate change and their child's worry about

climate change. In a UK sample of 15 adolescents aged 14 – 18, semi-structured interviews were conducted and it was reported that participants expressed feelings of anxiety, sadness, guilt, frustration, anger, and annoyance about climate change (Thompson et al., 2022). The researchers also explored participants' perceptions of the future, finding that some participants were hopeful for positive change, and some were sensing an impending doom and catastrophic urgency due to climate change.

Research is expanding on this topic and the above quantitative and qualitative studies showcase that children and adolescents have complex and varied emotional reactions, future perceptions, and thoughts/beliefs about climate change. While additional research is still needed to further understand the impact of climate change on mental health outcomes for this population, there is demonstratable evidence of an emotional impact (Busch & Ayala Chávez, 2022; Léger-Goodes et al., 2023; Thomas et al., 2022; Thompson et al., 2022). In order to further understand this, many researchers mention the existential aspects of climate change and argue for an existential consideration for contextualizing how and why climate change poses a potential threat to the emotional wellbeing of children and adolescents (Treble et al., 2023). However, very few studies explicitly link existential concepts with climate change emotions (see Budziszewska & Jonsson, 2021; Guthrie, 2023, for exceptions).

3.2.1 Exploring Climate Change as an Existential Threat

One study of adult psychotherapy patients, aged 18 – 49 years old, who self-reported having experiences with climate anxiety, used semi-structured interviews and found that existential themes were present amongst participant's discussions of feeling climate anxiety (Budziszewska & Jonsson, 2021). Another study used semi-structured

interviews of a sample of adult participants within an age range of 18 – 65+ experiencing emotional distress related to climate change and found that existentialism was an appropriate framework to conceptualize and further understand these experiences (Rehling, 2022). These studies demonstrate that existential theory may be a useful conceptual framework to understand some of the emotional reactions people are having to climate change. The ages of the participants in these studies were youth and adults, meaning that there is not much known about whether this is an applicable lens for younger populations such as children and school-aged adolescents. The present study aims to add to this knowledge base by exploring the emotions that Canadian adolescents are experiencing when thinking about climate change as well as how this may impact their future-oriented thinking. Despite a recent influx of studies on this topic that have shown the prevalence of these emotions among adolescents, more research is required to build a deeper understanding of this phenomenon.

3.3 Research Questions

1) What emotions do Canadian adolescents experience about climate change?

2) Does climate change impact adolescents' future-oriented thinking/plans for their futures?

3) Are existential threats or themes present for adolescents regarding climate change emotions and future oriented thinking?

3.4 Methodology

3.4.1 Study Context

Canada is the region of study for this research. It is worth noting that Canada represents an expansive geographic region with varying environmental characteristics and that data collection was completed (December of 2022) after some extreme weather events had occurred within Canada and with that an increased coverage and discourse of climate change in the media (such as the heat dome that occurred in British Columbia in summer of 2022, Bratu et al., 2022).

3.4.2 Paradigm

The research paradigm that underlies the proposed methodology is a constructivist paradigm. Constructivist research aims to construct knowledge based on the data collected, rather than interpreting the collected data through specific lens or frameworks searching for specific outcomes (Rehman & Alharthi, 2016). This approach attempts to remove as much researcher bias as possible, instead prioritizing and uplifting the participants' voices through ensuring all codes and themes generated are reflective of the participant and the context in which the data were shared (Rehman & Alharthi, 2016). This is an appropriate paradigm as it recognizes the subjectivity that exists about climate change awareness while also attempting to prioritize the voices of the adolescent participants.

3.4.3 Researcher Positionality

The members of the research team conducting the focus groups were Matt Treble (BSc, adult man, youth mental health counsellor), Tasha Roswell (BA, adult woman,

research assistant), and Dr. Gina Martin (PhD, adult woman, associate professor). I (Matt Treble) am a 26 year old, middle class, white man who is approaching this research with the perspective and influence of adolescent social identity development theory and existential theories. I personally believe that climate change is a significant global issue, and that informs my passion towards this research.

3.4.4 Online Focus Groups

Seven online focus groups were conducted over Zoom (https://zoom.us). Google JamBoards (https://jamboard.google.com) (an online brainstorming tool that allows for multiple users to contribute anonymously at the same time) were utilized at the beginning of the focus groups for data collection and to facilitate brainstorming. Each member of the research team was trained in focus group facilitation prior to data collection. Two trained researchers facilitated each focus group to guide participants through discussions, with one facilitator acting as the discussion lead, while the second one was available to take notes throughout and assist if technical difficulties arose. During each focus group, participants used an alias of their choosing and had their video off for anonymity, while the facilitating researchers had their video on. Each focus group had between two and five participants and took between one hour and ninety minutes.

The focus groups were the first part of a larger mixed-methods research project that utilized focus groups to gather data on Canadian adolescents' emotions about climate change and how they cope with these emotions, as well as gain feedback on current research tools related to climate change emotions used in surveys of adolescents. As such, the focus groups had two primary purposes: 1) to gather brainstorming and discussion-based data related to young people's perceptions and feelings in relation to

climate change; and 2) to gather feedback on current research survey items in relation to climate change emotions. Holding the focus groups online increased accessibility for participants across Canada. This data collection method was used rather than individual semi-structured interviews, or another method, as it allowed for brainstorming and dialogue between participants. To support Research Questions 2 and 3, an additional question was added to the focus group discussion guide in the brainstorming phase, to allow for exploration of if, and how, an awareness of climate change impacts future oriented thinking. The goal of Research Questions 2 and 3 was to give direct insight into the presence or absence of existential themes as future-oriented thinking is a way many adolescents make sense of larger, and sometimes more abstract, existential concerns (Berman et al., 2006). The focus group guide was developed by members of the research team and reviewed by three youth outside of the research team who have experience as youth co-facilitators of focus groups in other research studies.

Each focus group was done in 4 parts; (1) a brief icebreaker session; 2) four JamBoards that each addressed a specific question followed up by a discussion surrounding these responses to further expand the ideas brainstormed; 3) the focus group participants were then presented with various survey questions that have been asked in previous survey studies of young people; discussions were focused on impressions and utility of these questions; and finally, 4) a set of questions were posed about supports when dealing with climate change emotions.

To address the research questions of this study, two of the brainstorming questions (part 2) in the focus groups were examined. Specifically, 1) describe your feelings and emotions towards climate change; and 2) how does climate change affect

how you think about your future? These questions were presented to participants on Google JamBoard to generate brainstorming through the use of digital sticky notes where participants could freely and anonymously contribute their thoughts and responses. Afterwards, facilitators asked clarifying and follow-up questions to verbally explore and discuss the ideas on the JamBoard.

Each focus group was recorded and transcribed verbatim. I transcribed each focus group into text using Microsoft Stream's video to text transcription feature before reviewing myself for corrections. The text transcriptions were validated by a second researcher before data analysis took place.

Participants were recruited through digital advertising materials. Materials were circulated by a Canadian youth consultancy to their networks and through a research laboratory youth advisory council based in London, Ontario. Specifically, the research team submitted the advertising materials to these organizations and asked that they circulate the advertisement through their networks. Interested people were provided with a Letter of Information (Appendix D) and a pre-screen survey through Qualtrics survey software (https://qualtrics.com) (Appendix D) to determine eligibility and gather demographic data. Participants were deemed eligible if they reported living in Canada and being between 13 – 18 years of age. A $50 digital gift card was offered as compensation for each participant (advertised in recruitment materials). Eligible participants were then contacted and asked about availability for focus groups. This project was approved by the Athabasca University Research Ethics Board (# 25013).

3.4.5 Data Analysis

The analysis of the focus group data was completed in a two-phase approach similar to Fereday and Muir-Cochrane (2006), following a thematic analysis methodology. Fereday and Muir-Cochrane (2006) utilized a deductive to inductive thematic analysis where they applied pre-determined themes in their first round of coding and then took an inductive approach to generate new themes. In this study, a similar yet modified approach was taken in that a two-phase *inductive to deductive* approach was used. The first phase, an inductive phase, was used within the constructivist paradigm to generate codes from the raw, transcribed data. An inductive approach emphasizes the subjectivity of participant responses and allows for codes to be created subjectively in the context of which the data were provided (Creswell & Poth, 2018).

The second phase, the deductive phase, utilized an existential lens to look at the generated themes from the inductive phase to determine if there are any connections between these themes and seven pre-identified existential themes taken from Spinelli (2014). These themes were chosen as they were previously used by Budziszewska and Jonsson (2021) in their study on experiences of climate anxiety and existentialism. The pre-identified existential themes and their definitions can be found in Table 3.1.

Table 3.1

Existential Themes for Deductive Analysis of Data

Themes (Spinelli, 2014)	Definition (Spinelli, 2014)
Meaning and Meaninglessness	Meaning is inherently linked to how we view the world. Meaning-making is how we make sense of the world and our place within it. This is a very personal and subjective understanding of life and its meaning, or lack thereof.

Choice, Freedom, and Responsibility	Choice, freedom, and responsibility highlight our understanding of our positioning as an individual within a collective. This directly ties to relatedness of human beings and how we make sense of our responsibility to others.
Authenticity and Inauthenticity	Authenticity refers to one's ability to embody meaning, choice, freedom, and responsibility as an individual who is inherently related to other human beings. Living authentically is often tied to one's values and morals.
Isolation and Relatedness	Isolation exists in contrast to relatedness. Isolation refers to when our sense of individuality detracts from our ability to feel related with others in any capacity.
Death Anxiety	This refers to not only our anxiety towards our own death, but how our own death may or may not impact others. Additionally, it encompasses the finality of death and the uncertainty surrounding fate.
Temporality	How we situate ourselves within our understanding of the future.
Spatiality	Spatiality refers to both our physical space as well as our existential space (our understanding of the space we take within society and our relations to others). This involves recognizing that our state of being and space are constantly in motion and often dependent on our relatedness to others.

3.4.6 Inductive Phase

Raw data were imported into NVivo for analysis. First, two researchers (myself and the project coordinator) independently analyzed the focus group transcriptions, with each generating their own list of codes based on their interpretation of the data. After codes were generated, the two researchers convened to review the lists of individual codes. Once both researchers agreed on the emotion/feeling themes and future-oriented

themes, the two researchers used a fresh dataset to re-code datapoints into the newly generated themes. This time both researchers worked from the same agreed upon themes and coded each original data point to the theme(s) they felt appropriate. A test of interrater reliability was completed to determine agreement between the two researchers for thematic coding using the Kappa coefficient calculated with NVivo (Landis & Koch, 1977). This resulted in a finalized thematic analysis with all data points coded to themes for further analysis in the deductive phase.

3.4.7 Deductive Phase

In the deductive phase, the themes that stemmed from the future-oriented thinking brainstorm and discussion data were compared to the seven pre-determined existential key themes (Table 3.1). This analysis focused on data from the future-oriented thinking question. In some cases, there were instances of participants mentioning data that may have been relevant to this analysis in the emotions brainstorm and discussion (such as feeling uncertain towards the future), but this was intentionally left out to ensure that the datapoints were being reviewed within the intended context. The same two researchers independently reviewed the inductively generated themes and determined if they fit within one or more of the pre-identified existential themes. The researchers met to discuss their decisions and resolve any disagreements. A visual representation of this coding and theme generating process can be found in Figure 3.1.

3.5 Results

3.5.1 Participant Demographics

Table 3.2 highlights the demographic information for the focus group participants. The mean age of the participants was 16.6 years (range 15 - 18), 50% of the participant pool identified as a boy/man, with over half of the sample (54%) living in Ontario. There was ethnic diversity amongst the participant pool, and less than half (46%) of the participants reported involvement with climate action.

Table 3.2

Demographics and Characteristics of Focus Group Participants

Participant demographics and characteristics (N=24, aged 15-18 years old)		
	N	%
Gender		
Boy/Man	12	50
Girl/Woman	11	46
Non-Binary	1	4
Age (mean = 16.6 years-old)		
15	6	25
16	4	17
17	7	29
18	7	29
Race/Ethnicity		
Black	7	29
South Asian	7	29
White	5	21
Indigenous	2	8
West Asian	1	4
Macedonian	1	4
Indigenous and Black	1	4
Province/Territory		

Ontario	13	54
British Columbia	3	13
Alberta	2	8
Manitoba	2	8
Newfoundland and Labrador	1	4
Nova Scotia	1	4
Quebec	1	4
Saskatchewan	1	4
Involvement in climate activism		
Yes	11	46
No	11	46
Prefer not to say	2	8

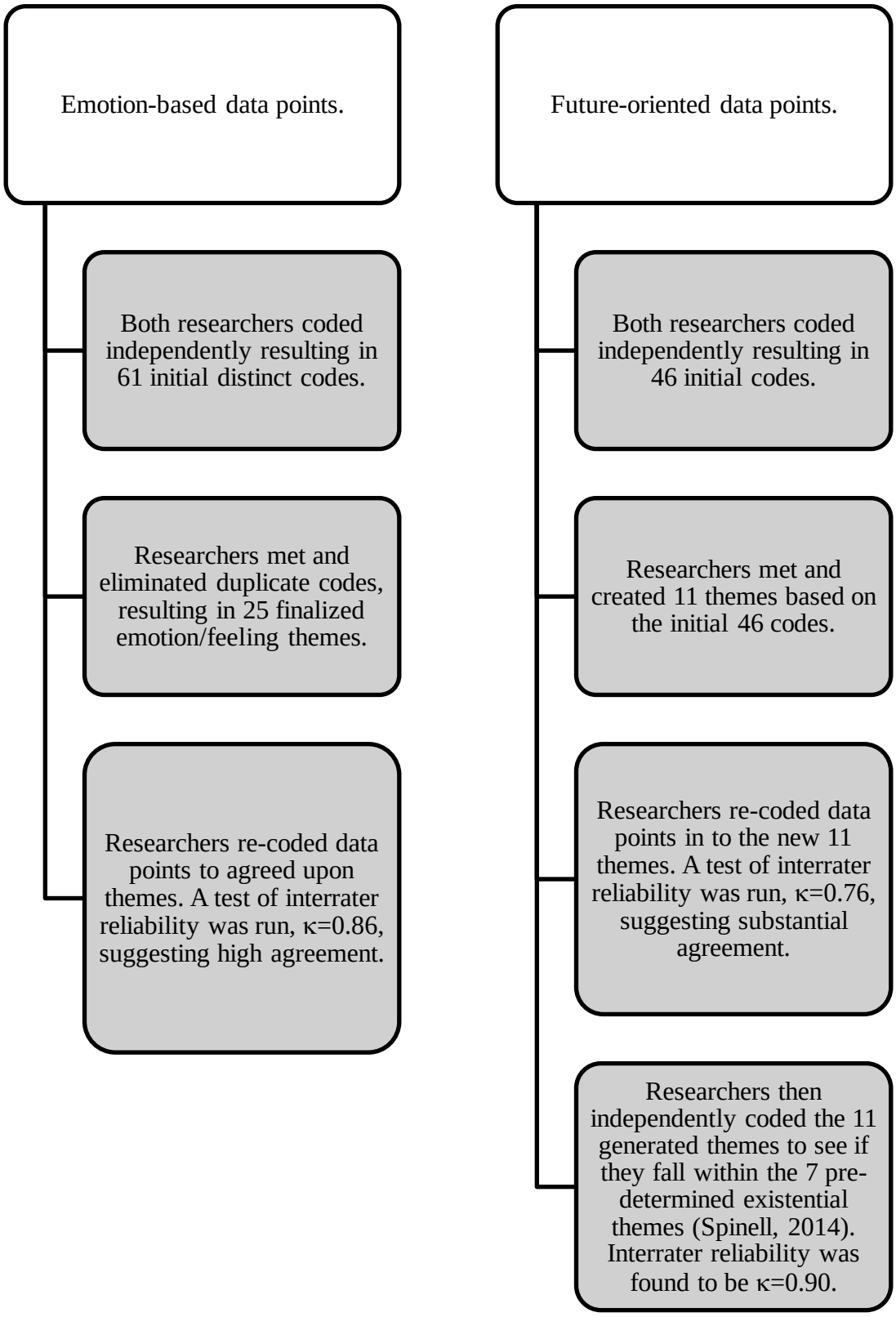

Figure 3.1: *Flow Chart Outlining Thematic Analysis and Coding Process*

Both researchers were in high subjective agreement over the coding of the data and had major similarities in their coding approaches despite doing this independently. For the emotion brainstorming activity and discussion, theme generation focused solely on emotion- or feeling-based words to ensure each emotional experience identified within the data was honoured and not overlooked. This resulted in 25 unique emotions and feelings being identified. Second, for the future-oriented brainstorming activity and discussion, both researchers generated codes that encapsulated broader ideas related to future-oriented thinking towards climate change. The two researchers convened and reviewed the independently generated codes to create 11 themes that encapsulated all codes and data points.

Once both researchers agreed on the 25 emotion/feeling themes and 11 future-oriented themes, the two researchers used a fresh dataset to re-code datapoints into the newly generated themes. This time both researchers worked from the same 25 emotion/feeling themes and 11 future-oriented themes and coded each original data point to the theme(s) they felt appropriate. Both researchers met to review the entire data set and resolve disagreements. Disagreements were resolved through discussion and collaboratively agreeing on the correct placement for each datapoint in a separate document so as not to interfere with a test of interrater reliability. It is worth noting that due to NVivo's interface, some disagreements were initially counted that were not true disagreements but rather differences in how the researchers selected each datapoint (e.g., "X said: I feel anxious" versus "I feel anxious"). These inconsistencies in data highlighting were corrected prior to testing interrater reliability to give the most accurate result.

For the emotions-based coding, Cohen's kappa for interrater reliability was found to be κ=0.86 which suggests there was near-perfect agreement between the two researchers based on the interpretation guide of Cohen's kappa which marks a κ value between 0.6 – 0.8 as substantial agreement and >.8 as near perfect agreement (Landis & Koch, 1977). In the coding for future-oriented thinking, interrater reliability was found to be κ=0.76 suggesting substantial agreement. Finally, the deductive process to explore the existential themes and their applicability to the dataset had an interrater reliability of κ=0.90 which suggests that there was excellent agreement between coders. Figure 3.2 visually showcases which inductively generated themes fell under which pre-determined existential key themes.

3.5.2 Emotional-Experiences of Canadian Adolescents Results

Table 3.3

Frequency Distribution Table for Emotions/Feelings Data

Emotion/Feeling	Percent Representation (out of 115 codes)	Sample Quote
Anxiety	13.9%	"I guess anxiety is a really big one because we are kind of uncertain of what's going to happen in the future." - *(girl, 17, Ontario) Focus Group #6*
Worry	10.4%	*" I'm worried about the entire situation." – *(boy, 15, British Columbia) Focus Group #3*
Concern	8.7%	*"It seems little is being done about the situation worldwide, so it's a matter of great concern for me." - *(boy, 15, British Columbia) Focus Group #3*

Unsure	8.7%	"I [feel] mixed because I don't really know how to feel and it's a lot of hearing what others say." – *(girl, 18, Ontario) Focus Group #1*
Anger	5.2%	"I put down anger because … we're kind of just sitting in the back seat and watching all of this happen." - *(girl, 17, Ontario) Focus Group #6*
Fear	5.2%	"I think uncertainty of anything that might happen is actually what scares me most times because I wouldn't know what could happen." – *(boy, 17, Manitoba) Focus Group #4*
Excited	3.5%	"But it also is bringing together a lot of people and bringing together like people who are interested in making a change. And that in that part, it's kind of exciting." – *(girl, 17, British Columbia) Focus Group #3*
Motivated	3.5%	"There is need for us to create change in our activities, the use of things, the way we do things, we need to do to have a change in our activities, so if we were to mitigate against climate change." – *(boy, 15, Alberta) Focus Group #6*
Confused	2.6%	"I think that in my life I've heard so many contrasting perspectives and different information and it's all kind of confusing to know which is reliable." – *(girl, 17, British Columbia) Focus Group #3*
Powerlessness	2.6%	"I feel like as an individual person, it's like, what can I do? Because even if we do recycle and we do try to be

		doing our best by the planet, all these large corporations that are so much bigger than us, they're doing so much worse." – *(girl, 17, British Columbia) Focus Group #2*
Defeated	1.7%	"When you hear like all these news about like what's happening, sometimes you feel like defeated like what can you do?" – *(girl, 17, British Columbia) Focus Group #2*
Disappointed	1.7%	"The disappointment is kind of geared towards larger corporations who kind of seem in control, who don't seem like they're doing as much as they could be." – *(girl, 17, British Columbia) Focus Group #3*
Guilt	1.7%	"Maybe like I'm not doing as much as I could be either." – *(girl, 17, British Columbia) Focus Group #3*
Hopelessness	1.7%	"Hopelessness both because it seems out of my control and because it feels like everything I have done to prepare for my future might be a waste." - *(anonymous JamBoard response) Focus Group #3*
Indifference	1.7%	*"Honestly, indifferent, although sometimes maybe powerlessness/hopelessness." - *(anonymous JamBoard response) Focus Group #5*
Negative Emotion (non-specific)	1.7%	"Negative – I don't see a positive outcome for the environment." - *(anonymous JamBoard response) Focus Group #2*
Panic	1.7%	*"Whenever you listen to the news about some kind of climate change, stuff like that

		and … you start getting panic and fear of what are people out there actually safe?" – *(boy, 17, Newfoundland and Labrador) Focus Group #5*
Stress	1.7%	**
Disbelief	0.9%	**
Frustrated	0.9%	**
Hope	0.9%	"And that [people trying to make change] gives like hope that it is possible to potentially fix the issue." – *(boy, 16, Ontario) Focus Group #7*
Inspiration	0.9%	"… it also like inspiring I guess to see some of the work that's being done by like youth and people my age." – *(girl, 18, Quebec) Focus Group #1*
Nervous	0.9%	*"I would say like nervous and anxious … because of just like not knowing what lies ahead." – *(girl, 18, Ontario) Focus Group #1*
Overwhelmed	0.9%	**
Pessimistic	0.9%	**

**Some quotes/datapoints were coded to more than one emotional code if they included reference to more than one emotional response that participant was expressing.*

***Some quotes/datapoints were single word answers as they originated from the JamBoard brainstorms but were not further elaborated within the discussion.*

The results in Table 4 indicate a wide array of emotional responses that the participants are experiencing. In some cases, the data points may have been singular words (such as "Disbelief.") as these were pulled from the JamBoard brainstorming and may not have been specifically elaborated on during the discussion. The percentage representations represent the frequency that code was present within the dataset (this

does not indicate a prevalence of this emotion amongst all participants as due to the nature of the focus groups not all participants spoke to each emotion). Among the most referenced emotional reactions were worry, anxiety, concern, and anger. It is worth noting that many of the identified emotional responses are ostensibly negative or unpleasant. However, there were emotional responses that indicated more positive or neutral reactions such as motivated, hope, inspiration, and excited.

3.5.3 Future-Oriented Thinking in the Context of Climate Change Results

Table 3.4

Future-Oriented Themes Generated from Inductive Thematic Analysis

Future-Oriented Themes	Explanation	Percent Representation (out of 79 codes)	Sample Quotes
Uncertainty towards personal future	A generalized sense of uncertainty or concern towards the participant's specific future.	17.7%	"How does this affect my health when I get older?" – *(girl, 17, British Columbia) Focus Group #2* "You don't know which areas are going to be affected like the most and how your life is going to be changed by it." – *(girl, 17, British Columbia) Focus Group #3*
Concern around changes to societal structure and livability	Specific concerns around changes to society's lifestyle, capitalist inflation, and daily activities.	13.9%	"I mean … a concern I had about that was … the rising demand of housing." – *(girl, 17, British Columbia) Focus Group #2* "[I've been] hearing about the rumours of stopping private vehicles." – *(boy, 15, Ontario) Focus Group #5*

Concern around planet health, physical environment, and resource availability	Specific concern around extreme weather events, damages to the environment, lack of resources available in later life, etc.	12.7%	"Resources not being available because we use it too much." – *(anonymous JamBoard response) Focus Group #2* "It makes me feel the environment may not be safe to live in." – *(anonymous JamBoard response) Focus Group #5*
Lack of personal concern for future	An expressed absence of concern for climate change impacting the individual participant's future.	11.4%	"I don't feel my future affected by climate change." – *(anonymous JamBoard response) Focus Group #3* "I don't think about climate change when I'm making plans about my future." – *(anonymous JamBoard response) Focus Group #4*
Desire to take climate-positive action	Participant expressed interest or desire in changing their lifestyle, supporting climate activism, reducing pollution, or other pro-climate behaviours.	10.1%	"It gave me kind of motivation now to talk to people about climate change, to also take action." – *(boy, 15, Alberta) Focus Group #6* "Motivated me to change parts of my lifestyle." – *(anonymous JamBoard response) Focus Group #3*
Concern around where to live or travel	Specific concerns around the safety of travel and living in other geographical areas.	7.6%	"Wary visiting certain locations due to higher risk." – *(anonymous JamBoard response) Focus Group #2* "Just traveling cause I also know that… flights also impose like a lot of emissions and harm to the environment." – *(girl, 17, British Columbia) Focus Group #2*

Concern around career choices or educational pursuits	Specific concerns around the viability of certain career/education paths or industries in an ever-changing world, including concerns around the point of pursuing and putting effort into these pathways.	6.3%	"It's going to cause many like side effects … that are potentially going to threaten on like our jobs, our education…" – *(girl, 17, Ontario) Focus Group #6* "I suppose the industry/career I choose. What industry will be viable in the future with climate change worsening." – *(anonymous JamBoard response) Focus Group #5*
Concern for humanity and loved ones	Externalized concern focused on humanity as a whole or specifically the participant's loved ones.	6.3%	"So, I don't think it's individually concerned with me, but I fear for the whole world. I fear for humanity. I fear for everyone." - *(boy, 15, British Columbia) Focus Group #3*
Concern around personal pollution and contribution to climate change	Specific concern around the participant's own conscious or unconscious contribution to climate change.	5.1%	"[Are] the purchases I make in the long run harmful to the environment?" – *(anonymous JamBoard response) Focus Group #2* "I was going to say how much I'm polluting." – *(boy, 17, Ontario) Focus Group #2*
Curiosity towards new opportunities and experiences	Interest in potential positive innovations, new climatic experiences, and/or climate-adaptive societies.	5.1%	"It might be positive in the sense for a future entrepreneur to be more conscious of protecting the environment." – *(anonymous JamBoard response) Focus Group #1* "I am curious to experience more of the polar and temperate climate conditions." – *(anonymous*

			JamBoard response) Focus Group #5
Concern around accountability of industries and governments	Specific concern around the lack of action and accountability of major polluting industries, actions of others, and governing bodies holding power.	3.8%	"The biggest change that needs to occur is what like actual industries and big companies [are doing] since they have much more of a strong impact." – *(boy, 16, Ontario) Focus Group #7*

Table 3.4 demonstrates that Canadian adolescents are comprehending their future world in relation to climate change in a variety of ways ranging from feelings of concern towards effects on multiple facets of life, a desire to take climate positive action, and a curiosity towards new opportunities and experiences that climate change may bring about. The theme of a generalized uncertainty towards one's personal future encompassed a sense of worry and uncertainty into how climate change may or may not impact one's future. Participants also identified concerns towards societal structure and livability, seemingly anticipating major societal shifts that could drastically change life as they know it. This is illustrated by one participant who stated:

> *"Since … we don't really know what's going to happen in the future, especially with climate change, we don't know how it's going to look like 10 years in the future. This gives us a general sense of like uncertainty. Like again, we don't know what's going to happen. There might be severe floods… there's going to be a sense of inflation as well in terms of government." – (girl, 17, Ontario) Focus Group #6*

Another participant talked about this uncertainty in the context of not knowing what lifestyle activities will be viable in the future:

> *"I feel if certain activities [are] cut off as a result of climate change, people will find it difficult to perform their daily activities." – (anonymous JamBoard response) Focus Group #5*

Conversely, an interesting finding was the presence of a lack of personal concern for the future. Participants who expressed this were not overly worried about the impact climate change may or may not have specifically on their own futures due to various reasons.

> *"I plan for the future anyways irrespective of what it holds." – (anonymous JamBoard response) Focus Group #4*

Another participant demonstrated this concept by emphasizing they are less worried about their own future prospects, but rather worry for everyone's futures:

> *"This issue of climate change will affect everyone, every human being, in every part of the world… So I don't think its individually concerned with me, but I fear for the whole world. I fear for humanity. I fear for everyone." – (boy, 15, British Columbia) Focus Group #3*

Some participants expressed a desire to take climate-positive action in the future and/or a curiosity towards new opportunities and experiences. For example, this quote shows how seeing young people take climate-positive action is motivating her to consider what role she could take in combatting climate change.

> *"People like Greta Thunberg, she's someone who was very young, like almost around our age, and to see that she's taking so much on herself to make a difference around the world, I feel like that's a little bit motivating for me because I'm like, if she can do it, why can't we?" – (girl, 17, Ontario) Focus Group #6*

This next quote offered a different perspective that highlights a curiosity towards new technological advances to help humanity deal with climate change, resulting in a more efficient society:

> *"I envision an action-oriented world with advanced hyper efficient metropolises with boundless resources." – (anonymous JamBoard response) Focus Group #3*

3.5.4 Future-Oriented Results Applied to Existential Themes

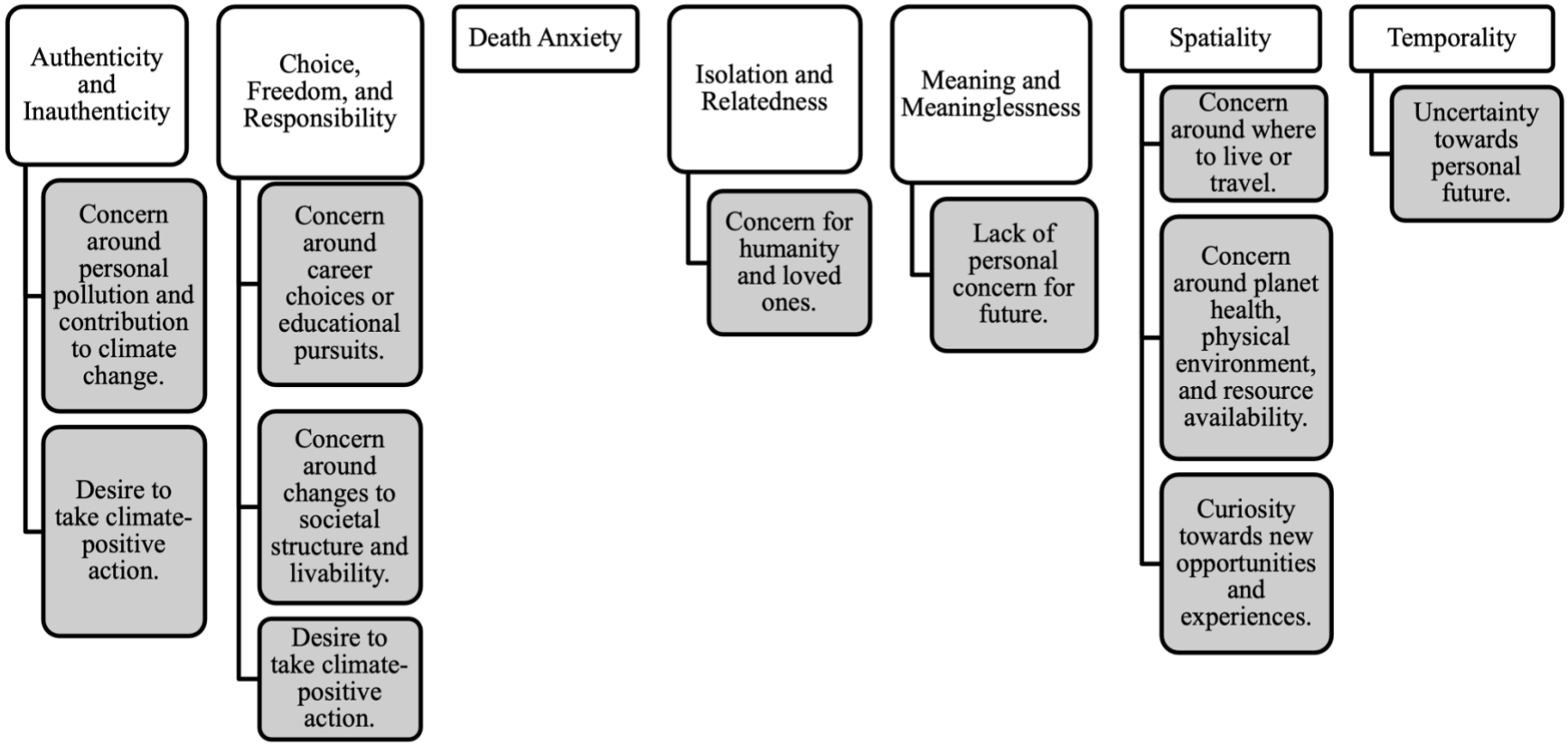

Figure 3.2: *Future-Oriented Themes Grouped into Existential Key Themes*

The results in Figure 3.2 showcase how Spinelli's (2014) existential key themes of an existential framework were found to encompass what Canadian adolescents are thinking about their futures regarding climate change. Some of the generated themes were applicable to more than one existential theme and thus were coded accordingly. It could be argued that the existential theme of temporality could apply to all of our generated themes since they are all future-oriented, but the researchers opted to only include the uncertainty towards personal future theme here. This was done to honour the specificity of the nature of this theme which was directly tied to uncertainty towards the individual's personal future, meaning it was inherently tied to personal temporality.

The only existential theme that did not appear to fit with any of the generated themes is death anxiety. In this study, the participants did not overtly discuss any semblance of death anxiety related to their futures with climate change. Many of the participants' concerns towards their futures were centered around their choices and freedoms in relation to how they plan their futures. As well, many participants identified concerns or curiosity towards how the planet will be impacted by climate change, thus spatiality was a common result.

It is also worth noting that the theme of "lack of personal concern for future" was determined to fall under the "meaning and meaninglessness" category. Both researchers discussed that the context of the data that lead to the generation of this theme showcased a sense of individual meaning and purpose the participants had that allowed them to not feel concerned about climate change impacting their personal future. This is not implying that the data suggest that not being concerned is a form of existential meaninglessness, but rather allowed us to acknowledge that the meaning those participants hold in their

own lives may not be inherently linked to the impact climate change may or may not have on their future.

3.6 Discussion

The results of this study add more knowledge to the growing base of research centering young people's experiences with climate change and their resulting thoughts and feelings. The current study found that Canadian adolescents are experiencing a wide array of emotions and feelings towards climate change. Amongst the more discussed emotional responses were anxiety, concern, worry, uncertainty, and anger. These results support the findings of other studies who also report common emotional responses in children and adolescents to be anxiety, concern, and worry (Busch & Ayala Chávez, 2022; Galway & Field, 2023; Hickman et al., 2021; Léger-Goodes et al., 2023; Thomas et al., 2022; Thompson et al., 2022). The feeling of hope experienced by some of the participants is similar to findings in some qualitative research in the United Kingdom (Thompson et al., 2022) and some quantitative research in the United Kingdom (Finnegan, 2022) of similar ages. There are some emotions our participants reported that are less commonly discussed in other studies; these include confused, defeated, disbelief, excited, indifference, inspiration, motivated, and pessimistic.

Directly comparing to studies involving Canadian adolescents and children (Galway & Field, 2023; Léger-Goodes et al., 2023), our study found shared emotional experiences amongst this population of anger, anxiety, disappointment, fear, frustration, helplessness, overwhelmed, powerlessness, sadness, stress, and uncertainty. Emotional reactions to climate change are an important factor to consider when discussing how to

support adolescents who feel impacted. It is important to note that emotional reactions are not clinical diagnoses and often are rational psychological responses to difficult situations. Regardless, these responses indicate that the participants may be needing support processing this vast array of emotions in response to climate change (Treble et al., 2023).

Additionally, our results demonstrate that climate change impacts some adolescents' future-oriented thinking in a variety of ways. While there was substantial evidence of various ways climate change creates a landscape of concern for the participants of this study, there is evidence that emotions may serve as important factors for action, as thinking about the future may create motivation to attempt to make change for some. There is also evidence that the prospect of a changing climate may create a genuine interest in new experiences and opportunities for some. Thompson et al.'s (2022) qualitative study of adolescents from the United Kingdom used semi-structured interviews to assess the participants' perceptions of the future. Their results indicated two predominant themes and perspectives of the future which were hopeful for change and catastrophic. The researchers identified that some participants who were hopeful for change were expressing interest in awareness and action to help address climate change. This is thematically similar to the generated theme of a desire to take climate-positive action. Conversely, their theme of catastrophic perceptions of the future shared some similarities with concerns the participants of this present study identified surrounding planet health, pollution, resource availability, and the accountability of governments and industries.

The final deductive thematic analysis showcased that existential themes were applicable to the participant's future-oriented thinking. The presence of existential themes is supported by the research of Budziszewska and Jonsson (2021) and Rehling (2022), who found that existential themes were present in adult psychotherapy patients' experiences of climate anxiety and that an existential framework was appropriate for conceptualizing emotional distress adults experienced related to climate change respectively. This acknowledge study supports that Canadian adolescents may also be experiencing existential threats within their understanding of climate change and its impacts on their lives.

3.6.1 Impacts for Policy and Practice

The results of this study highlight a noticeable concern that climate change is creating unpleasant or negative thoughts, feelings, and beliefs for some Canadian adolescents. While more research is needed to continue to build upon this growing knowledge base, the results of this study continue to serve as a call-to-action for mental health professionals who work with children and adolescents to be aware of how climate change is impacting many adolescents emotional wellbeing. As climate change is predicted to continue to worsen over time, it is vital for mental health professionals to begin to consider targeted and specific interventions and supports for young people who may require support with these arising emotions, feelings, and challenging thoughts about the future.

3.6.2 Limitations

A noted limitation with online focus groups is that it is challenging to verify the participant authenticity in terms of study eligibility (Bouchard, 2016). To address this,

when a researcher had concerns about participant eligibility during data collection (e.g., screen name not matching provided name or provided pseudonym) the researchers privately asked that participant to confirm the demographic information they provided during the pre-screen survey in a private online room with one researcher prior to beginning the focus group. Participants who were unable to provide this information or provided information that did not match what was previously provided (i.e., age > +/-1 year or location of residence differed) without an explanation were not included in the focus group discussions. This occurred five times.

Additionally, this study was only offered in English which limits access for potential participants who are not fluent in English. The digital nature of this study and its recruitment processes also limits those without internet access. Finally, despite our inclusion criteria being those aged 13 – 18 years old, younger participants were not represented meaning younger voices were not included in the data analysis.

3.7 Conclusion

This study identified various emotional responses to climate change that Canadian adolescents are experiencing. Additionally, this study identified different ways that Canadian adolescents feel their future-oriented thinking and planning may or may not be impacted by climate change. The results of this study offer evidence that can aid adolescent mental health professionals to begin developing targeted support strategies and therapies to aid adolescents as they navigate these complex feelings and cognitions.

3.8 Key Practitioner Message:

Adolescents are experiencing emotional reactions to climate change that warrant further exploration. Researchers have suggested a potential existential influence, yet this is under researched.

This study used a qualitative approach to examine emotional reactions and factors surrounding future-oriented thinking that adolescents are experiencing from their awareness of climate change. Findings suggest an existential influence. This knowledge can inform practitioners in how they support adolescents struggling with these issues.

Chapter 4. Discussion

4.1 Introduction

This final Chapter will summarize and reiterate the findings of this thesis and discuss the strengths and limitations of the original research. Additionally, these findings will be discussed within the context of potential implications for policy and practice within the field of counselling psychology. Finally, recommendations for future research are made.

4.2 Key Findings

- There is a substantial gap in available research specifically on children's and adolescents' emotional and mental wellbeing in the context of climate change.
- Many researchers and academics reference climate change as an existential threat, yet this is not widely researched.
- Canadian adolescents report multiple and complex emotional experiences as a result of climate change.
- Climate change is posing a unique concern to some Canadian adolescents in that it is impacting their future-oriented thinking in various ways; yet some Canadian adolescents do not view climate change as having a negative impact on their emotional responses or future-oriented thinking.
- The research in this thesis suggests that existential themes are applicable to how Canadian adolescents are perceiving their futures in the context of climate change.

- Existential themes and theory may be a useful framework to understand how and why climate changes influences Canadian adolescents' perceptions of their futures.
- In summary, Canadian adolescents are experiencing a wide range of emotional responses to climate change as well as identifying various ways climate change is impacting their future-oriented thinking. Existential psychology may be an appropriate framework to understand these impacts.

Chapter 3 showcases a variety of experiences from Canadian adolescents in the context of their awareness or experiences of climate change. When this is taken into consideration with the narrative review in Chapter 2, a clear picture begins to form detailing the variety of ways climate change may create issues for today's Canadian adolescents. An existential understanding of this issue continues to show promise as an appropriate conceptualization of how and why climate change creates these issues for Canadian adolescents.

From the emotional response results from Chapter 3 the most commonly reported emotional responses were anxiety, worry, and concern. Both qualitative and quantitative existing research often report anxiety and worry to be the most prevalent emotional responses reported (Brophy et al., 2022; Busch & Ayala Chávez, 2022; S. D. Clayton et al., 2023; Galway & Field, 2023; Hickman, 2020; Hickman et al., 2021; Léger-Goodes et al., 2023; Martin et al., 2022; Sciberras & Fernando, 2022; Thompson et al., 2022; Verplanken et al., 2020). This adds to this understanding that one of the most common emotional responses to climate change can be anxiety or worry for children and

adolescents. Specific to Canadian adolescents, one recent qualitative study on children aged 8 – 12 years found that some participants reported feeling anxious or stressed (the researchers grouped these emotional responses together) (Léger-Goodes et al., 2023). Another study of 1000 Canadians aged 16 – 25 reported that 56% of their sample reported feeling anxious in the context of climate change (Galway & Field, 2023). While more emotional reactions in response to climate change exist for children and adolescents, anxiety or worry seem to be among one of the most common emotional experiences both in this study and in existing literature.

Anxiety is often viewed as a future-oriented emotion as it is anticipatory in nature (Baumgartner et al., 2008). Despite this direct link between existing research that highlights anxiety as a common emotional response and anxiety's connection to future-oriented thinking, there is very little climate-specific research examining the impacts on future-oriented thinking for children and adolescents. Galway and Field (2023) report that amongst their sample of Canadian young people 73% reported thoughts that the future is frightening, 48% reported feeling the government has betrayed them and/or future generations, and 39% reported feeling hesitation to have children due to climate change. While the future-oriented results from the study presented in this thesis found broader themes, Galway and Field's (2023) results are similar to the themes of "uncertainty towards personal future" and "concern around accountability of industries and governments". More research is needed to continue understanding the different dimensions of their futures that children and adolescents are feeling worried, anxious, and concerned about, but the results in Chapter 3 provide a foundational understanding of some of the ways this is occurring for Canadian adolescents.

Finally, the applicability of existentialism to the understanding of how climate change creates a threat that can create emotional responses and thoughts surrounding one's future is a growing aspect of research on climate change impacts on children and adolescents. Chapter 3's results demonstrate that existential themes were applicable to many of the ways Canadian adolescents are thinking about their future in the context of climate change. My research used the same existential key themes that Budziszewska and Jonsson (2022) utilized in their study on adult psychotherapy patients' experiences of climate anxiety. Their research found that all of the existential key themes were present in their participant's experiences with climate anxiety. This is similar to the results of Chapter 3 as all of the existential key themes were found to be applicable to Canadian adolescent's thoughts of their future in the context of climate change, with the exception of "death anxiety".

Comparatively, Rehling's (2022) theory-driven study utilized the existential concepts of death, isolation, meaning, and freedom/responsibility to understand the adult participants' experiences of eco-anxiety. While the study used different existential concepts, Rehling (2022) reports that existential theory and concepts are an appropriate framework for understanding eco-anxiety experiences. This is a similar takeaway from this research's results in that existential concepts can be applied to Canadian adolescents' thoughts of their future in the context of climate change.

The results of the original research presented in this thesis contribute to the growing knowledge base of how climate change is impacting children and adolescents. There is substantial overlap and similarities between this study's findings and those of existing literature. The more novel contributions from this research pertain to the

thematic analysis of future-oriented thinking for Canadian adolescents within the context of climate change, as this is a largely under researched phenomenon. Additionally, the applicability of existential themes continues to add legitimacy to the notion that existential theory is an appropriate theoretical framework to conceptualize the impacts climate change is having on children and adolescents. More research is still needed both on children and adolescents' future-oriented thinking and how existentialism fits into this, but the key findings of this thesis contribute valuable knowledge to this research area.

4.3 Expanded Strengths and Limitations

This thesis contributes original findings to the growing field of research on children and adolescents within the context of climate change. One of the novelties of this thesis is the exploration of future-oriented thinking for Canadian adolescents. This is a facet of climate change research that has not been deeply explored, especially for younger people. Future-oriented thinking was used to explore the applicability of existentialism for this demographic. The future-oriented thinking results demonstrate areas of concern that Canadian adolescents may require support with as they navigate future-planning.

Another area of strength was the exploratory examination of emotions Canadian young people are experiencing. 25 emotional responses to climate change were identified in this research. Many of these emotional responses are well supported by existing literature and research such as anger, anxiety, concern, disappointed, fear, frustrated, guilt, hope, hopelessness, nervous, overwhelmed, powerlessness, stress, unsure, and

worry (Busch & Ayala Chávez, 2022; Finnegan, 2022; Galway & Field, 2023; Hickman, 2020; Léger-Goodes et al., 2023; Sciberras & Fernando, 2022; Thomas et al., 2022). However, the exploratory approach yielded other results that are not commonly discussed in theoretical work or empirical research (e.g., confusion, indifference, inspiration, and motivation). Thereby, this research's use of inductive methodology is a strength as it allowed for the identification of less common research findings that may have been missed had a strictly deductive methodology been used (Woo et al., 2017).

In addition to the strengths identified above, there are some limitations to this thesis. Chapter 2 is a narrative review of current literature on children's and adolescents' psychological reactions to climate change. Narrative reviews do not have robust methodologies, such as systematic reviews, and thus could potentially be missing relevant literature that is not identified by the authors (Ferrari, 2015). For example, without a systematic approach, authors of a narrative review could purposefully only select articles that further their point of view (Ferrari, 2015). Throughout the process of writing the narrative review, I attempted to mitigate these limitations through the use of iterative feedback from co-authors who are active in this research field. Despite these potential limitations, narrative reviews are beneficial as they allow for an in-depth and comprehensive exploration of the topic (Collins & Fauser, 2005). A narrative review was the most appropriate approach for this topic as the goal was to establish a broad and encompassing snapshot of current literature pertaining to the psychological impacts of climate change for children and adolescents while applying an existential lens.

Another limitation worth discussing is the online focus group data collection method used within Chapter 3. Online focus group methodology was used for

convenience in that it allowed for accessibility for Canadian adolescents from all over Canada to participate and to allow for richer discussions as the online focus group participants had opportunities to bounce ideas off of each other and delve deeper into their discussion points (Bouchard, 2016; Stewart & Shamdasani, 2017). However, certain ideas or themes may not have been discussed in each focus group due to the brainstorming approach taken. This means that some participants may experience specific emotional responses or impacts to future-oriented thinking but did not bring it up if they did not think of it in the moment. As well, as discussed in Chapter 3, online focus groups pose a challenge for verifying participant demographic information which was important for deeming eligibility (Stewart & Shamdasani, 2017). A final consideration was that our research team had hoped to gain participants aged 13 – 18 years old, but unfortunately our recruitment did not gain any participants aged 13 – 14.

4.4 Implications for Policy and Practice and the Counselling Field

One of the primary goals of this thesis was to identify areas of concern that children and adolescents are experiencing from an emotional and mental wellbeing perspective. I have approached this thesis from the perspective of the field of counselling psychology, yet I believe these implications are applicable to any mental health professional, social worker, or individual who works with young people who may be experiencing these thoughts and feelings. The emotional reactions the study in Chapter 3 identified highlight the need for mental health professionals to be ready to support children and adolescents who may be struggling processing these emotional reactions. To further justify the necessity for all mental health professionals to be aware of this

phenomenon, it is being argued that climate change needs to be viewed as a determinant of mental health (Singh et al., 2022).

Through a counselling-specific lens, the counselling field needs to be prepared for an influx of children and adolescents seeking support with emotional and mental wellbeing in relation to climate change. One relevant and important piece of research emphasized the experiences of adult psychotherapy patients who sought therapy to help with emotional reactions in relation to climate change (Budziszewska & Jonsson, 2022). Their results highlighted specific factors of therapy being a notable contributor to salience for the participants. These included the therapist's own knowledge and competence around climate change and coping with it, honouring and validating emotional reactions to climate change, and emotional management and regulation strategies. Some participants also noted feeling a sense of meaning and community when therapy was focused on the participant's personal values and/or was action-oriented.

An existential perspective will lend support to the position that existential therapies may be beneficial to use in support of children and adolescents navigating difficult thoughts and feelings resulting from climate change. The emphasis in existential therapies on meaning and living authentically could be useful in helping children and adolescents engage in their developmental processes (such as identity formation) while still addressing unpleasant thoughts and feelings from climate change (Ramsey-Wade, 2015; Vos et al., 2015). Specifically, literature on the use of existential therapies and concepts for adolescents argues that simply the inclusion of existential concepts can be enough to be beneficial to alleviate mental and emotional distress (Baumel & Constantino, 2020; Shumaker, 2012; Treble et al., 2023). An existential approach could

potentially work to support many of the residual feelings and cognitions that climate change causes, while also actively working to help children and adolescents create new senses of meaning within their lives (Henson, 2017; Vos et al., 2015).

The counselling field needs to be prepared for an influx of children and adolescents struggling with emotional and mental wellbeing in relation to climate change. I have discussed specific therapeutic approaches that could show promise for children and adolescents struggling with these issues including existential therapies and ACT (Treble et al., 2023). However, I want to highlight a counter perspective which de-emphasizes the need for a specific approach or therapy and instead encourages practitioners to draw upon existing literature to amalgamate techniques to best support children and adolescents.

These techniques should include a therapist awareness of climate change, its impacts, and the realities of how it may or may not impact the emotional and mental wellbeing of children and adolescents (Budziszewska & Jonsson, 2022; Treble et al., 2023). As well, standard counselling techniques of supporting clients with emotional management and regulation will support those struggling with these issues from a climate-specific lens (Budziszewska & Jonsson, 2022). Finally, both Budziszewska and Jonsson (2022) and Ojala (2013) specifically mention meaning-focused outcomes or coping strategies. Meaning-focused coping has been shown to be protective for children with climate change worry in that they experience greater positive affect (Ojala, 2013). This concept of meaning, whether as a coping approach or a therapeutic outcome, ties directly back to the existential concept of meaning and its importance in one's life. While there is currently not enough climate-specific research to fully validate therapeutic

approaches, the approaches, therapies, and techniques outlined above show promise in supporting children and adolescents who are struggling with thoughts and feelings surrounding climate change.

4.5 Recommendations for Future Research

The findings of this research support existing literature by highlighting a range of emotional responses to climate change for Canadian adolescents. As well, this research discovered themes of how climate change may or may not be impacting Canadian adolescents' perceptions of their futures. This study utilized Canadian adolescents aged 15-18, but more knowledge on how these patterns may or may not exist for younger adolescents and children would be a valuable contribution for future research. Additionally, this study's use of focus groups supported the overall goal of this research and thesis. However, future studies should consider individual semi-structured interviews to eliminate the potential of "group-think". Similar to this study, future studies should also prioritize seeking participants who engage in climate activism as well as those who do not, to provide a balanced perspective and potentially allow for comparisons to be drawn between those demographics.

In order to integrate therapeutic supports directly into this research field, a future study could use similar methodology to Budziszewska and Jonsson's (2021, 2022) two studies that directly assess psychotherapy patients' experiences of therapy in relation to climate change and its impacts on their emotional and mental wellbeing. Through adopting similar methodologies in studies with younger participants, we could continue to explore the best avenues of support.

I believe that qualitative research on this topic is valuable as it allows children and adolescents to have their voices heard. However, I see a lot of benefit for future studies to adopt quantitative methodologies to provide additional evidence sources to this growing knowledge base. A future quantitative study could use measures of climate change emotions, existential anxiety, and other emotional and mental wellness scales to explore if associations exist between these variables. This knowledge could be used to help explore potential avenues for therapeutic directions. The newness of this research area means that we are going to need studies focusing on children and adolescents in order to draw solid conclusions on how to best support them moving forward, rather than inferring from studies of adults.

4.6 Conclusion

My thesis contributes to the growing knowledge base surrounding climate change's impacts on the emotional and mental wellbeing of children and adolescents. More research is going to be required to determine the best avenues for counsellors and other mental health professionals who work with children and adolescents who may be affected by these issues. While their efficacy cannot be said conclusively, suggested avenues for therapeutic support that are worth future investigation were identified from the findings of this thesis.

References

Adams, M. (2014). Human development and existential counselling psychology. *Counselling Psychology Review*, *29*(2), 34–42.

Arnett, J. J. (1999). Adolescent storm and stress, reconsidered. *American Psychologist*, *54*(5), 317.

Bailen, N. H., Green, L. M., & Thompson, R. J. (2019). Understanding emotion in adolescents: A review of emotional frequency, intensity, instability, and clarity. *Emotion Review*, *11*(1), 63–73.

Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety. *International Journal of Environmental Research and Public Health*, *18*(18), 9636.

Baumel, W. T., & Constantino, J. N. (2020). Implementing logotherapy in its second half-century: Incorporating existential considerations into personalized treatment of adolescent depression. *Journal of the American Academy of Child and Adolescent Psychiatry*, *59*(9), 1012.

Baumgartner, H., Pieters, R., & Bagozzi, R. P. (2008). Future-oriented emotions: Conceptualization and behavioral effects. *European Journal of Social Psychology*, *38*(4), 685–696.

Belsky, J. (2019). Early-life adversity accelerates child and adolescent development. *Current Directions in Psychological Science*, *28*(3), 241–246.

Berman, S. L., Weems, C. F., & Stickle, T. R. (2006). Existential anxiety in adolescents: Prevalence, structure, association with psychological symptoms and identity development. *Journal of Youth and Adolescence*, *35*, 285–292.

Bouchard, K. L. (2016). Anonymity as a double-edge sword: Reflecting on the implications of online qualitative research in studying sensitive topics. *The Qualitative Report*, *21*(1), 59–67.

Branje, S. (2022). Adolescent identity development in context. *Current Opinion in Psychology*, *45*, 101286.

Bratu, A., Card, K. G., Closson, K., Aran, N., Marshall, C., Clayton, S., Gislason, M. K., Samji, H., Martin, G., & Lem, M. (2022). The 2021 Western North American heat dome increased climate change anxiety among British Columbians: Results from a natural experiment. *The Journal of Climate Change and Health*, *6*, 100116.

Brophy, H., Olson, J., & Paul, P. (2022). Eco-anxiety in youth: An integrative literature review. *International Journal of Mental Health Nursing*.

Budziszewska, M., & Jonsson, S. E. (2021). From climate anxiety to climate action: An existential perspective on climate change concerns within psychotherapy. *Journal of Humanistic Psychology*, 0022167821993243.

Budziszewska, M., & Jonsson, S. E. (2022). Talking about climate change and eco-anxiety in psychotherapy: A qualitative analysis of patients' experiences. *Psychotherapy*.

Burke, S. E., Sanson, A. V., & Van Hoorn, J. (2018). The psychological effects of climate change on children. *Current Psychiatry Reports*, *20*, 1–8.

Busch, K., & Ayala Chávez, R. (2022). Adolescent framings of climate change, psychological distancing, and implications for climate change concern and behavior. *Climatic Change*, *171*(3–4), 21.

Butler, C. D. (2018). Climate change, health and existential risks to civilization: A comprehensive review (1989–2013). *International Journal of Environmental Research and Public Health*, *15*(10), 2266.

Button, B. L., & Martin, G. (2023). Exploring Extreme Weather and Recess Policies, Practices, and Procedures in the Canadian Context. *International Journal of Environmental Research and Public Health*, *20*(1), 814.

Chen, S., Bagrodia, R., Pfeffer, C. C., Meli, L., & Bonanno, G. A. (2020). Anxiety and resilience in the face of natural disasters associated with climate change: A review and methodological critique. *Journal of Anxiety Disorders*, *76*, 102297.

Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, *74*, 102263.

Clayton, S. D., Pihkala, P., Wray, B., & Marks, E. (2023). Psychological and emotional responses to climate change among young people worldwide: Differences associated with gender, age, and country. *Sustainability*, *15*(4), 3540.

Clayton, S., Manning, C., Krygsman, K., & Speiser, M. (2017). Mental health and our changing climate: Impacts, implications and guidance. *American Psychological Association and ecoAmerica*. https://www.apa.org/news/press/releases/2017/03/mental-health-climate.pdf

Coffey, Y., Bhullar, N., Durkin, J., Islam, M. S., & Usher, K. (2021). Understanding eco-anxiety: A systematic scoping review of current literature and identified knowledge gaps. *The Journal of Climate Change and Health*, *3*, 100047.

Collins, J. A., & Fauser, B. C. (2005). Balancing the strengths of systematic and narrative reviews. *Human Reproduction Update*, *11*(2), 103–104.

Cook, J. (2022). Understanding and countering misinformation about climate change. *Research Anthology on Environmental and Societal Impacts of Climate Change*, 1633–1658.

Coppola, I., & Pihkala, P. (2023). Complex dynamics of climate emotions among environmentally active Finnish and American young people. *Frontiers in Political Science, 4*, 160.

Correia, E. A., Cooper, M., Berdondini, L., & Correia, K. (2017). Characteristic practices of existential psychotherapy: A worldwide survey of practitioners' perspectives. *The Humanistic Psychologist*, *45*(3), 217.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Sage Publications.

Davidov, J., & Russo-Netzer, P. (2022). Exploring the phenomenological structure of existential anxiety as lived through transformative life experiences. *Anxiety, Stress, & Coping*, *35*(2), 232–247.

Diffey, J., Wright, S., Uchendu, J. O., Masithi, S., Olude, A., Juma, D. O., Anya, L. H., Salami, T., Mogathala, P. R., & Agarwal, H. (2022). "Not about us without us"–the feelings and hopes of climate-concerned young people around the world. *International Review of Psychiatry*, *34*(5), 499–509.

DuLong, J. (2022, October). Do you have "eco-anxiety"? Here's how to find out. *CNN Health*. https://www.cnn.com/2022/08/12/health/eco-anxiety-harmful-for-health-wellness/index.html

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, *5*(1), 80–92.

Ferrari, R. (2015). Writing narrative style literature reviews. *Medical Writing*, *24*(4), 230–235.

Finnegan, W. (2022). Educating for hope and action competence: A study of secondary school students and teachers in England. *Environmental Education Research*, 1–20.

Frankl, V. E. (2014). *The will to meaning: Foundations and applications of logotherapy*. Penguin.

Galway, L. P., & Field, E. (2023). Climate emotions and anxiety among young people in Canada: A national survey and call to action. *The Journal of Climate Change and Health*, 100204.

Gasparri, G., Imbago-Jácome, D., Lakhani, H., Yeung, W., & El Omrani, O. (2022). Adolescents and youth are prioritising human rights in the climate change agenda. *Bmj*, *379*.

Godden, N. J., Farrant, B. M., Yallup Farrant, J., Heyink, E., Carot Collins, E., Burgemeister, B., Tabeshfar, M., Barrow, J., West, M., & Kieft, J. (2021). Climate change, activism, and supporting the mental health of children and young people: Perspectives from Western Australia. *Journal of Paediatrics and Child Health*, *57*(11), 1759–1764.

Gregory, A. (2021, October). "Eco-anxiety": Fear of environmental doom weighs on young people. *The Guardian*.

https://www.theguardian.com/society/2021/oct/06/eco-anxiety-fear-of-environmental-doom-weighs-on-young-people

Grose, A. (2020). *A guide to eco-anxiety: How to protect the planet and your mental health*. Watkins Media Limited.

Guthrie, D. (2023). How I Learned to Stop Worrying and Love the Eco-Apocalypse: An Existential Approach to Accepting Eco-Anxiety. *Perspectives on Psychological Science*, *18*(1), 210–223.

Hall, G. S. (1905). *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion and education* (Vol. 2). D. Appleton.

Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018). Climate change and mental health: Risks, impacts and priority actions. *International Journal of Mental Health Systems*, *12*(1), 1–12.

Helm, S. V., Pollitt, A., Barnett, M. A., Curran, M. A., & Craig, Z. R. (2018). Differentiating environmental concern in the context of psychological adaption to climate change. *Global Environmental Change*, *48*, 158–167.

Henson, M. (2017). Death anxiety and climate chaos: What good is therapy when it's already too late. *Inside Out*, *8*, 18–27.

Hickman, C. (2020). We need to (find a way to) talk about… Eco-anxiety. *Journal of Social Work Practice*, *34*(4), 411–424.

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and

young people and their beliefs about government responses to climate change: A global survey. *The Lancet Planetary Health, 5*(12), e863–e873.

Hogg, T. L., Stanley, S. K., O'Brien, L. V., Wilson, M. S., & Watsford, C. R. (2021). The Hogg Eco-Anxiety Scale: Development and validation of a multidimensional scale. *Global Environmental Change, 71,* 102391.

Joerchel, A., & Dreher, E. (2015). Adolescence and transitions in developmental psychology. In *Biographical Ruptures and Their Repair: Cultural Transitions in Development.*

Jurica, J., Barenz, J., Shim, Y., Graham, K., & Steger, M. F. (2014). Ultimate concerns from existential and positive psychological perspectives. *Meaning in Positive and Existential Psychology*, 115–128.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 159–174.

Lawrance, E. L., Thompson, R., Newberry Le Vay, J., Page, L., & Jennings, N. (2022). The impact of climate change on mental health and emotional wellbeing: A narrative review of current evidence, and its implications. *International Review of Psychiatry*, *34*(5), 443–498.

Léger-Goodes, T., Malboeuf-Hurtubise, C., Hurtubise, K., Simons, K., Boucher, A., Paradis, P.-O., Herba, C. M., Camden, C., & Généreux, M. (2023). How children make sense of climate change: A descriptive qualitative study of eco-anxiety in parent-child dyads. *Plos One, 18*(4), e0284774.

Léger-Goodes, T., Malboeuf-Hurtubise, C., Mastine, T., Généreux, M., Paradis, P.-O., & Camden, C. (2022). Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change. *Frontiers in Psychology*, *13*.

Leonhardt, M., Granrud, M. D., Bonsaksen, T., & Lien, L. (2022). Associations between Mental Health, Lifestyle Factors and Worries about Climate Change in Norwegian Adolescents. *International Journal of Environmental Research and Public Health*, *19*(19), 12826.

Ma, T., Moore, J., & Cleary, A. (2022). Climate change impacts on the mental health and wellbeing of young people: A scoping review of risk and protective factors. *Social Science & Medicine*, 114888.

Martin, G., Cosma, A., Roswell, T., Anderson, M., Treble, M., Leslie, K., Card, K. G., Closson, K., Kennedy, A., & Gislason, M. (2023). Measuring negative emotional responses to climate change among young people in survey research: A systematic review. *Social Science & Medicine*, 116008.

Martin, G., Reilly, K., Everitt, H., & Gilliland, J. A. (2022). The impact of climate change awareness on children's mental well-being and negative emotions–a scoping review. *Child and Adolescent Mental Health*, *27*(1), 59–72.

Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., & Gomis, M. (2021). Climate change 2021: The physical science basis. *Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, *2*.

Maxwell, M. J., & Gayle, S. (2013). Counseling adolescent existential issues. *VISTAS: Ideas and Research You Can Use*.

McGushin, A., Gasparri, G., Graef, V., Ngendahayo, C., Timilsina, S., Bustreo, F., & Costello, A. (2022). Adolescent wellbeing and climate crisis: Adolescents are responding, what about health professionals? *Bmj*, *379*.

McLeod, S. (2013). *Erik Erikson's stages of psychosocial development*.

Morganstein, J. C., & Ursano, R. J. (2020). Ecological disasters and mental health: Causes, consequences, and interventions. *Frontiers in Psychiatry*, *11*, 1.

Nadarajah, K., David, J.-C., Brun, L., Bordel, S., Moyon, L., Le Foll, D., Delouvée, S., & Somat, A. (2022). "We Are Running Out of Time": Temporal Orientation and Information Seeking as Explanatory Factors of Climate Anxiety among Young People. *Psych*, *4*(3), 560–573.

Obradovich, N., Migliorini, R., Paulus, M. P., & Rahwan, I. (2018). Empirical evidence of mental health risks posed by climate change. *Proceedings of the National Academy of Sciences*, *115*(43), 10953–10958.

Ogunbode, C. A., Doran, R., Hanss, D., Ojala, M., Salmela-Aro, K., van den Broek, K. L., Bhullar, N., Aquino, S. D., Marot, T., & Schermer, J. A. (2022). Climate anxiety, wellbeing and pro-environmental action: Correlates of negative emotional responses to climate change in 32 countries. *Journal of Environmental Psychology*, *84*, 101887.

Ojala, M. (2012). Hope and climate change: The importance of hope for environmental engagement among young people. *Environmental Education Research*, *18*(5), 625–642.

Ojala, M. (2013). Coping with climate change among adolescents: Implications for subjective well-being and environmental engagement. *Sustainability*, *5*(5), 2191–2209.

Ojala, M. (2016). Young people and global climate change: Emotions, coping, and engagement in everyday life. *Geographies of Global Issues: Change and Threat*, *8*(1), 1–19.

Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review. *Annual Review of Environment and Resources*, *46*, 35–58.

Pierrehumbert, R. (2019). There is no Plan B for dealing with the climate crisis. *Bulletin of the Atomic Scientists*, *75*(5), 215–221.

Pihkala, P. (2020). Eco-anxiety and environmental education. *Sustainability*, *12*(23), 10149.

Pörtner, H.-O. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

Rachini, M. (2022, September). Climate anxiety is affecting more & more people. Here's how some doctors are trying to treat it. *CBC*. https://www.cbc.ca/radio/thecurrent/climate-anxiety-treatment-1.6593657

Ramsey-Wade, C. (2015). Acceptance and commitment therapy: An existential approach to therapy? *Existential Analysis*, *26*(2).

Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*. University of California Press Oakland.

Rehling, J. T. (2022). Conceptualising eco-anxiety using an existential framework. *South African Journal of Psychology*, *52*(4), 472–485.

Rehman, A. A., & Alharthi, K. (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, *3*(8), 51–59.

Reyes, M. E. S., Carmen, B. P. B., Luminarias, M. E. P., Mangulabnan, S. A. N. B., & Ogunbode, C. A. (2021). An investigation into the relationship between climate change anxiety and mental health among Gen Z Filipinos. *Current Psychology*, 1–9.

Reynolds, J. (2014). *Understanding existentialism*. Routledge.

Royal College of Psychiatrists. (2020, November 22). *The climate crisis is taking a toll on the mental health of children and young people.* https://www.rcpsych.ac.uk/news-and-features/latest-news/detail/2020/11/20/the-climate-crisis-is-taking-a-toll-on-the-mental-health-of-children-and-young-people

Sanson, A., & Bellemo, M. (2021). Children and youth in the climate crisis. *BJPsych Bulletin*, *45*(4), 205–209.

Sanson, A. V., Van Hoorn, J., & Burke, S. E. (2019). Responding to the impacts of the climate crisis on children and youth. *Child Development Perspectives*, *13*(4), 201–207.

Schwartz, S. J., Donnellan, M. B., Ravert, R. D., Luyckx, K., & Zamboanga, B. L. (2013). *Identity development, personality, and well-being in adolescence and emerging adulthood: Theory, research, and recent advances.*

Sciberras, E., & Fernando, J. W. (2022). Climate change-related worry among Australian adolescents: An eight-year longitudinal study. *Child and Adolescent Mental Health, 27*(1), 22–29.

Scott, B. G., & Weems, C. F. (2013). Natural disasters and existential concerns: A test of Tillich's theory of existential anxiety. *Journal of Humanistic Psychology*, *53*(1), 114–128.

Shumaker, D. (2012). An existential–integrative treatment of anxious and depressed adolescents. *Journal of Humanistic Psychology*, *52*(4), 375–400.

Singh, G., Xue, S., & Poukhovski-Sheremetyev, F. (2022). Climate emergency, young people and mental health: Time for justice and health professional action. *BMJ Paediatrics Open*, *6*(1).

Skovdal, M., & Benwell, M. C. (2021). Young people's everyday climate crisis activism: New terrains for research, analysis and action. *Children's Geographies*, *19*(3), 259–266.

Spinelli, E. (2014). Practising existential therapy: The relational world. *Practising Existential Therapy*, 1–288.

Stanley, S. K., Hogg, T. L., Leviston, Z., & Walker, I. (2021). From anger to action: Differential impacts of eco-anxiety, eco-depression, and eco-anger on climate action and wellbeing. *The Journal of Climate Change and Health*, *1*, 100003.

Stewart, D. W., & Shamdasani, P. (2017). Online focus groups. *Journal of Advertising*, *46*(1), 48–60.

Temple, M., & Gall, T. L. (2018). Working through existential anxiety toward authenticity: A spiritual journey of meaning making. *Journal of Humanistic Psychology*, *58*(2), 168–193.

Thiery, W., Lange, S., Rogelj, J., Schleussner, C.-F., Gudmundsson, L., Seneviratne, S. I., Andrijevic, M., Frieler, K., Emanuel, K., & Geiger, T. (2021). Intergenerational inequities in exposure to climate extremes. *Science*, *374*(6564), 158–160.

Thomas, I., Martin, A., Wicker, A., & Benoit, L. (2022). Understanding youths' concerns about climate change: A binational qualitative study of ecological burden and resilience. *Child and Adolescent Psychiatry and Mental Health*, *16*(1), 110.

Thomas, J., & McDonagh, D. (2013). Shared language: Towards more effective communication. *The Australasian Medical Journal*, *6*(1), 46.

Thompson, R., Fisher, H. L., Dewa, L. H., Hussain, T., Kabba, Z., & Toledano, M. B. (2022). Adolescents' thoughts and feelings about the local and global environment: A qualitative interview study. *Child and Adolescent Mental Health*, *27*(1), 4–13.

Thuiller, W. (2007). Climate change and the ecologist. *Nature*, *448*(7153), 550–552.

Treble, M., Cosma, A., & Martin, G. (2023). Child and Adolescent Psychological Reactions to Climate Change: A Narrative Review Through an Existential Lens. *Current Psychiatry Reports*, 1–7.

United Nations. (n.d.). *What is Climate Change?* https://www.un.org/en/climatechange/what-is-climate-change

Urry, J. (2015). *Climate change and society*. Springer.

van Nieuwenhuizen, A., Hudson, K., Chen, X., & Hwong, A. R. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations. *Current Psychiatry Reports, 23*, 1–9.

Vergunst, F., & Berry, H. L. (2022). Climate change and children's mental health: A developmental perspective. *Clinical Psychological Science, 10*(4), 767–785.

Verplanken, B., Marks, E., & Dobromir, A. I. (2020). On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming? *Journal of Environmental Psychology, 72*, 101528.

Verplanken, B., & Roy, D. (2013). "My worries are rational, climate change is not": Habitual ecological worrying is an adaptive response. *PloS One, 8*(9), e74708.

Vos, J. (2016). Working with meaning in life in mental health care: A systematic literature review of the practices and effectiveness of meaning-centred therapies. *Clinical Perspectives on Meaning: Positive and Existential Psychotherapy*, 59–87.

Vos, J., Craig, M., & Cooper, M. (2015). Existential therapies: A meta-analysis of their effects on psychological outcomes. *Journal of Consulting and Clinical Psychology*, *83*(1), 115.

Woo, S. E., O'Boyle, E. H., & Spector, P. E. (2017). Best practices in developing, conducting, and evaluating inductive research. *Human Resource Management Review*, *27*(2), 255–264.

World Health Organization. (2016). *Adolescent health: World health organization*.

World Health Organization. (2021). *Young people's fight against climate change: Actions we can take for health and well-being*.

World Health Organization. (2023). *New WHO guidelines on parenting aim to help child maltreatment and enhance parent-child relationships.*

Wray, B. (2022). *Generation dread: Finding purpose in an age of climate crisis*. Knopf Canada.

Zieske, C. (2020). A Brief History and Overview of Existential-Phenomenological Psychology. *American Journal of Undergraduate Research, 17*(2).

Appendix A: Copyright Permission from Springer Nature

SPRINGER NATURE LICENSE
TERMS AND CONDITIONS

Nov 03, 2023

This Agreement between Mr. Matthew Treble ("You") and Springer Nature ("Springer Nature") consists of your license details and the terms and conditions provided by Springer Nature and Copyright Clearance Center.

License Number: 5655490040146

License date: Oct 24, 2023

Licensed Content Publisher: Springer Nature

Licensed Content Publication: Current Psychiatry Reports

Licensed Content Title: Child and Adolescent Psychological Reactions to Climate Change: A Narrative Review Through an Existential Lens

Licensed Content Author: Matthew Treble et al

Licensed Content Date: Jun 24, 2023

Type of Use: Thesis/Dissertation

Requestor type: academic/university or research institute

Format: electronic

Portion: full article/chapter

Will you be translating?: no

Circulation/distribution: 1 - 29

Author of this Springer Nature content: yes

Title of new work: CLIMATE CHANGE EMOTIONS AND FUTURE-PLANNING AMONG CANADIAN ADOLESCENTS: EXPLORING CONNECTIONS TO EXISTENTIAL ANXIETY

Institution name: Athabasca University

Expected presentation date: Dec 2023

Requestor Location: Mr. Matthew Treble, 1050 Tattersall Drive, Victoria, BC V8X 2X4, Canada

Attn: Mr. Matthew Treble

Total

0.00 CAD

Terms and Conditions

Springer Nature Customer Service Centre GmbH Terms and Conditions

The following terms and conditions ("Terms and Conditions") together with the terms specified in your [RightsLink] constitute the License ("License") between you as Licensee and Springer Nature Customer Service Centre GmbH as Licensor. By clicking 'accept' and completing the transaction for your use of the material ("Licensed Material"), you confirm your acceptance of and obligation to be bound by these Terms and Conditions.

1. **Grant and Scope of License**

    1. The Licensor grants you a personal, non-exclusive, non-transferable, non-sublicensable, revocable, world-wide License to reproduce, distribute, communicate to the public, make available, broadcast, electronically transmit or create derivative works using the Licensed Material for the purpose(s) specified in your RightsLink Licence Details only. Licenses are granted for the specific use requested in the order and for no other use, subject to these Terms and Conditions. You acknowledge and agree that the rights granted to you under this License do not include the right to modify, edit, translate, include in collective works, or create derivative works of the Licensed Material in whole or in part unless expressly stated in your RightsLink Licence Details. You may use the Licensed Material only as permitted under this Agreement and will not reproduce, distribute, display, perform, or otherwise use or exploit any Licensed Material in any way, in whole or in part, except as expressly permitted by this License.

2. You may only use the Licensed Content in the manner and to the extent permitted by these Terms and Conditions, by your RightsLink Licence Details and by any applicable laws.

3. A separate license may be required for any additional use of the Licensed Material, e.g. where a license has been purchased for print use only, separate permission must be obtained for electronic re-use. Similarly, a License is only valid in the language selected and does not apply for editions in other languages unless additional translation rights have been granted separately in the License.

4. Any content within the Licensed Material that is owned by third parties is expressly excluded from the License.

5. Rights for additional reuses such as custom editions, computer/mobile applications, film or TV reuses and/or any other derivative rights requests require additional permission and may be subject to an additional fee. Please apply to journalpermissions@springernature.com or bookpermissions@springernature.comfor these rights.

2. **Reservation of Rights**

Licensor reserves all rights not expressly granted to you under this License. You acknowledge and agree that nothing in this License limits or restricts Licensor's rights in or use of the Licensed Material in any way. Neither this License, nor any act, omission, or statement by Licensor or you, conveys any ownership right to you in any Licensed Material, or to any element or portion thereof. As between Licensor and you, Licensor owns and retains all right, title, and interest in and to the Licensed Material subject to the license granted in Section 1.1. Your permission to use the Licensed Material is expressly conditioned on you not impairing Licensor's or the applicable copyright owner's rights in the Licensed Material in any way.

3. **Restrictions on use**

1. Minor editing privileges are allowed for adaptations for stylistic purposes or formatting purposes provided such alterations do not alter the original meaning or intention of the Licensed Material and the new figure(s) are still accurate and representative of the Licensed Material. Any other changes including but not limited to, cropping, adapting, and/or omitting material that affect the meaning, intention or moral rights of the author(s) are strictly prohibited.

2. You must not use any Licensed Material as part of any design or trademark.

3. Licensed Material may be used in Open Access Publications (OAP), but any such reuse must include a clear acknowledgment of this permission visible at the same time as the figures/tables/illustration or abstract and which must indicate that the Licensed Material is not part of the governing OA license but has been reproduced with permission. This may be indicated according to any standard referencing system but must include at a minimum 'Book/Journal title, Author, Journal Name (if applicable), Volume (if applicable), Publisher, Year, reproduced with permission from SNCSC'.

4. **STM Permission Guidelines**

1. An alternative scope of license may apply to signatories of the STM Permissions Guidelines ("STM PG") as amended from time to time and made available at https://www.stm-assoc.org/intellectual-property/permissions/permissions-guidelines/.

2. For content reuse requests that qualify for permission under the STM PG, and which may be updated from time to time, the STM PG supersede the terms and conditions contained in this License.

3. If a License has been granted under the STM PG, but the STM PG no longer apply at the time of publication, further permission must be sought from the Rightsholder.
Contact journalpermissions@springernature.com or bookpermissions@springernature.com for these rights.

5. **Duration of License**

1. Unless otherwise indicated on your License, a License is valid from the date of purchase ("License Date") until the end of the relevant period in the below table:

Reuse in a medical communications project	Reuse up to distribution or time period indicated in License
Reuse in a dissertation/thesis	Lifetime of thesis

Reuse in a journal/magazine	Lifetime of journal/magazine
Reuse in a book/textbook	Lifetime of edition
Reuse on a website	1 year unless otherwise specified in the License
Reuse in a presentation/slide kit/poster	Lifetime of presentation/slide kit/poster. Note: publication whether electronic or in print of presentation/slide kit/poster may require further permission.
Reuse in conference proceedings	Lifetime of conference proceedings
Reuse in an annual report	Lifetime of annual report
Reuse in training/CME materials	Reuse up to distribution or time period indicated in License
Reuse in newsmedia	Lifetime of newsmedia
Reuse in coursepack/classroom materials	Reuse up to distribution and/or time period indicated in license

6. **Acknowledgement**

1. The Licensor's permission must be acknowledged next to the Licensed Material in print. In electronic form, this acknowledgement must be visible at the same time as the figures/tables/illustrations or abstract and must be hyperlinked to the journal/book's homepage.

2. Acknowledgement may be provided according to any standard referencing system and at a minimum should include "Author, Article/Book Title, Journal name/Book imprint, volume, page number, year, Springer Nature".

7. **Reuse in a dissertation or thesis**

1. Where 'reuse in a dissertation/thesis' has been selected, the following terms apply: Print rights of the Version of Record are provided for;

electronic rights for use only on institutional repository as defined by the Sherpa guideline (www.sherpa.ac.uk/romeo/) and only up to what is required by the awarding institution.

2. For theses published under an ISBN or ISSN, separate permission is required. Please contact journalpermissions@springernature.com or bookpermissions@springernature.com for these rights.

3. Authors must properly cite the published manuscript in their thesis according to current citation standards and include the following acknowledgement: '*Reproduced with permission from Springer Nature*'.

8. **License Fee**

You must pay the fee set forth in the License Agreement (the "License Fees"). All amounts payable by you under this License are exclusive of any sales, use, withholding, value added or similar taxes, government fees or levies or other assessments. Collection and/or remittance of such taxes to the relevant tax authority shall be the responsibility of the party who has the legal obligation to do so.

9. **Warranty**

1. The Licensor warrants that it has, to the best of its knowledge, the rights to license reuse of the Licensed Material. **You are solely responsible for ensuring that the material you wish to license is original to the Licensor and does not carry the copyright of another entity or third party (as credited in the published version).** If the credit line on any part of the Licensed Material indicates that it was reprinted or adapted with permission from another source, then you should seek additional permission from that source to reuse the material.

2. EXCEPT FOR THE EXPRESS WARRANTY STATED HEREIN AND TO THE EXTENT PERMITTED BY APPLICABLE LAW, LICENSOR PROVIDES THE LICENSED MATERIAL "AS IS" AND MAKES NO OTHER REPRESENTATION OR WARRANTY. LICENSOR EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY CLAIM ARISING FROM OR OUT OF THE CONTENT, INCLUDING BUT NOT LIMITED TO ANY ERRORS, INACCURACIES, OMISSIONS, OR DEFECTS CONTAINED THEREIN, AND ANY IMPLIED OR EXPRESS WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL LICENSOR BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE, OR EXEMPLARY DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, VIEWING OR USE OF THE LICENSED MATERIAL REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION APPLIES NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.

10. **Termination and Cancellation**

1. The License and all rights granted hereunder will continue until the end of the applicable period shown in Clause 5.1 above. Thereafter, this license will be terminated and all rights granted hereunder will cease.

2. Licensor reserves the right to terminate the License in the event that payment is not received in full or if you breach the terms of this License.

11. **General**

1. The License and the rights and obligations of the parties hereto shall be construed, interpreted and determined in accordance with the laws of the Federal Republic of Germany without reference to the stipulations of

the CISG (United Nations Convention on Contracts for the International Sale of Goods) or to Germany´s choice-of-law principle.

2. The parties acknowledge and agree that any controversies and disputes arising out of this License shall be decided exclusively by the courts of or having jurisdiction for Heidelberg, Germany, as far as legally permissible.

3. This License is solely for Licensor's and Licensee's benefit. It is not for the benefit of any other person or entity.

Appendix B: Focus Group Guide

Preamble (to be delivered jointly by research team)

Researcher 1: Thank you for joining us today for a discussion about your feelings about climate change and how you cope with these feelings. My name is [researcher 1] and this is [researcher 2], we are both researchers at Athabasca University working with a larger team of university professors and youth collaborators to understand the ways that Canadian teenagers feel about climate change and how they cope with those feelings.

This group discussion will start with some brainstorming activities [jam sessions] to start considering how you feel about climate change. We will then discuss some of the questions that researchers have used in studies to examine these thoughts and feelings to get your opinion of them. We will end with some more discussion about supports for teenagers.

Researcher 2: Again, thanks for joining us for this discussion. This is an opportunity for us to learn about teens' thoughts and feelings about climate change and if the ways researchers ask about these feelings gets at what is important to you. The information you provide us with will help us to understand the experience of Canadian teens and we hope this understanding will lead to more informed supports.

I know you've already completed the consent form online, but I want to remind you that your participation today is totally voluntary. You can share as little or as much as you like, you can skip any questions, and you can leave the call at any time. We will be recording our discussion so that we don't miss any of your comments.

There are **ABSOLUTELY** no wrong answers, and we really want to emphasize that **this is a judgement-free zone**. We want to acknowledge that this might be a topic that people have varying opinions and emotions about. In order to make this a safe space for everyone, we are going to be taking a curious and non-judgmental approach. This means we may ask clarifying questions or explore statements without assuming the intent of the statements. That said, in the event someone is being purposefully hurtful to others, we will message them privately in the chat to find a resolution, or in extreme cases may have to remove them from the zoom call. Is there anything else we can do that we have not mentioned that will help this be a safe space for you all?

Researcher 1: Before we proceed, we would like to cover a few housekeeping things. First, we ask that you kindly unmute your microphone and keep your camera off for the remainder of the discussion. We understand that this may cause some disruption with people talking over one another, but we will all be mindful of everyone's experiences and ensure that you all have a voice in this. Second, we ask that you ONLY use the chat function for technical issues. If you do become disconnected from audio, please enter your question or comment in the chat and we will read it aloud.

Does anyone have any questions before we move along?

Great – We understand that talking about how we feel can sometimes be difficult. We are putting a list of supports in the chat now [put list in the chat]

[Researcher 2] will be here to take notes and help make sure things run smoothly, but I will be leading our discussion from now on.

Researcher 1: *To start, let's do a short round of introductions. On the screen there are a few questions. Let's all share our screen name and our answer to any one of the questions on the screen. I will start us off.*

[Share screen with list of questions] 1) If you could go anywhere, where would it be? 2) What is your favourite subject in school and why? 3) What are the top 2 songs on your playlist right now?4) Share a boring fact about yourself.

Researcher 1: Great! It is nice to get to know everyone a bit better. Now, we will start with a brainstorming exercise about climate change.
We are going to use what's called a jam board so that everyone can put their thoughts up and be anonymous as your name won't be associated with what you write. It is basically a digital board where you can put what comes into your mind.
[Jam board 1]: What is the first thing that comes to your mind when you think about climate change? [Please give a word or short sentence]

We will leave this here for two-minutes or a little longer if ideas are still coming in [have music playing]

Researcher 1: Thank you [give quick debrief of what was stated]

Researcher 1: Now we are going to do a jam board but asking for you to describe your feelings and emotions towards the climate change.

[Present second jam board] How would you describe the way you feel when you think about climate change? Please list all emotions, these can be positive and negative, that reflect your feelings about climate change. [Please give a word or short sentence]

Again, we will leave this up for two-minutes or a little longer if ideas are still coming in [have music playing].

Thank you! It looks like all responses are in.

Researcher 1: Let's discuss some of these emotions a bit.

- Are there any that are particularly important to you?
- Did any surprise you?
- Can you tell the group more about that emotion?
- What about [Researcher 1 to pick out any emotion that isn't covered later on]? Can anyone talk about if this is something they feel?

Researcher 1: Thank you! Now let's do one more jam board, but this time thinking about ways which you cope or deal with unpleasant emotions and feelings about climate change? In other words, is there anything (like thoughts or actions) that help you deal with any unpleasant feelings and emotions or that makes you feel better about climate change? (Give examples if prompts are needed: e.g., talking with friends, attending climate action events, thinking of things I can do)

Researcher 1: Thank you.
Let's discuss some of these ways of dealing a bit.
Prompts:

- Are there any that are particularly important to you?
- Did any surprise you?
- Can you tell us a bit more about that?
- What about [Researcher to pick out coping measures that aren't covered later on]? Can anyone talk about if this is something they feel?

Thank you!

Now we are going to look at questions researcher's ask about youth's experience with climate change. I will share my screen and show you some questions used in surveys. You will see that each question consists of a question itself and a series of response options. We are interested in hearing your thoughts on these questions and responses.

Researcher 1: First, we are going to discuss worry.

I will share my screen- Here is the first question:
[Share screen: Present question 1 on screen]
[*How worried are you about climate change?] 4 = very worried, 3 = somewhat worried, 2 = not very worried, and 1 = not at all worried.*

Prompts:

- What does this question mean to you?
- Do you understand/like the question?
- What do you like about this question, why?
- What do you dislike/or would want to change so it makes more sense to you?

- What do you think someone who answers '4' very worried' is like?
- What do you think someone who answers '1' not at all worried' is like?

If we changed the question so that it asked: *How <u>concerned are you</u> about climate change?]*
[Change screen share] 4 = very concerned, 3 = somewhat concerned, 2 = not very concerned, and 1 = not at all concerned.

Does the meaning of this question change for you or stay the same? How?

Researcher 1: Thank you for your ideas and discussion! We really appreciate them. Now we are going to show you another question about worry:

[Change screen share]

"How much do you worry about the negative consequences caused by climate change for 1) you, 2) your close ones, 3) future generations, 4) people living in economically deprived countries, and 5) animals/nature [4 = very worried, 3 = somewhat worried, 2 = not very worried, and 1 = not at all worried]

<u>Prompts:</u>

- What does this question mean to you?
- What do you like about this question?
- What do you dislike/or would want to change so it makes more sense to you?
- What do you think someone who answers 'very worried' to all these questions is like?
- What do you think someone who answers not worried to all the questions is like?
- How do you feel about this question compared to the single questions about worry and concern (the two other ones we showed you)?

Researcher 1: Another way researchers often ask about emotions around climate change is by giving a checklist of feelings and emotions.

I am going to share my screen again
Multiple emotions: List of emotions – Responses 1 (yes/no/don't want to say)/ responses 2 (frequencies) – Fear, concern, optimism, anxiety, anger, interest, indifference, sad, helpless, hopeful, anxious, afraid, guilty, ashamed, hurt, depressed despair, grief, powerlessness

<u>Prompts:</u>

- Are there any feelings or emotions missing,
- Are there any feelings that don't make sense to include or are confusing?
- Should any of these feelings or emotions be removed and why?

- Should any be added and why?

Researcher 1: Beyond thoughts and feelings, we think it is important to think about how these emotions about climate change could impact the lives of people your age. Here is a question that researchers have used that is trying to get at this.

[change screen]

My feelings about climate change negatively affect my daily life
(at least one of the following: Eating, concentrating, work, school, sleeping, spending time in nature, playing, having fun, relationships) | Responses: yes/no/prefer not to say

Researcher 1:

Prompts:

- Is anything missing from this list?
- Are there any that don't make sense to include or are confusing?
- Should any of these be removed and why?
- Should any be added and why?

Researcher 1: If the question was worded like this- [change screen- *items all individual*], would it change the way you think of this question? Which do you prefer/ think allows you to best answer.

Researcher 1: Thanks so much for all of your great feedback. We have one final set of questions to show you, about what people do or think when reminded about climate change.

When people hear about societal problems such as climate change, people can feel worried or upset.

Below is a list, and for every item we would like you to indicate how well it applies to what you do or think when you are reminded of climate change.

[share screen] More and more people have started to take climate change seriously; I have faith in humanity; people can fix environmental problems; I trust scientists to come up with a solution in the future; I have confidence in people engaged in environmental organizations; I trust in politicians; Even though it is a big problem, we have to have hope; I think that the problem is exaggerated; I don't care since I don't know much about climate change; Climate change could be positive; Nothing serious will happen during my lifetime; Climate change won't affect people in my town or city; I think about

what I myself can do; I search for information about what I can do; I talk with my family and friends about what people can do to help

The response alternatives are: ―not true at all‖, ―not very true‖, ―fairly true‖, ―very true‖, and ―completely true‖

Researcher 1:

Prompts:

- What do these questions mean to you?
- What do you like about this question?
- What do you dislike/or would want to change so it makes more sense to you?
- Is there anything missing here about what you think or do when reminded of climate change?

Researcher 1: Thank you so much for answering these questions. This has been very helpful.

We have a few final questions about supports for youth dealing with thoughts and feelings about the climate crisis and then we will finish up.

Researcher 1:

What kind of support do you currently have when dealing with your thoughts and feelings about climate change?

What kind of supports would be nice to have?

Researcher 1: Thanks so much for taking the time to go through these questions and for this wonderful discussion.

Is there anything that is important to you about your thoughts and feelings about climate change and how you cope that we didn't cover?

Researcher 2: Before we sign off do you have any questions for us?

Anticipated q & a:

- Where to get findings: Blog (MHCCA), report – we can send a copy to you by email if you are interested

- Letter of participation and $50 gift card will be sent within the week.

Researcher 1 or 2: Thank you again for your time! It was great to meet all of you and spend this time learning from you!

Appendix C: COREQ Table

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	38
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	38
3. Occupation	What was their occupation at the time of the study?	38
4. Gender	Was the researcher male or female?	38
5. Experience and training	What experience or training did the researcher have?	38
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	39
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	39
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	38
Domain 2: Study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	38, 42-43
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	41
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	41
12. Sample size	How many participants were in the study?	45-46

13. Non-participation	How many people refused to participate or dropped out? Reasons?	N/A
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	39-42
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	N/A
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	45-46
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	40
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	41
20. Field notes	Were field notes made during and/or after the interview or focus group?	40
21. Duration	What was the duration of the interviews or focus group?	40
22. Data saturation	Was data saturation discussed?	39-42
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	41
Domain 3: Analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	43
25. Description of the coding tree	Did authors provide a description of the coding tree?	47
26. Derivation of themes	Were themes identified in advance or derived from the data?	42-44
27. Software	What software, if applicable, was used to manage the data?	43
28. Participant checking	Did participants provide feedback on the findings?	43-44
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	49-52, 53-57, 61

30. Data and findings consistent	Was there consistency between the data presented and the findings?	60-61
31. Clarity of major themes	Were major themes clearly presented in the findings?	49-52, 53-56
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	49-52, 53-56

Appendix D: Letter of Information for Participants/Pre-screen Questions

You are invited to take part in a research project entitled, **Canadian Adolescents & Climate Change: Emotional Responses & Coping Strategies**

Thank you for your interest in participating in our discussion about Canadian teens and climate change. Through focus group discussions (a group of people who have been brought together to discuss a particular topic), we want to talk about your feelings and emotions about climate change. We also look at the questions researchers use when they are studying climate change emotions and will ask you to tell us what you think.

This form is part of the process of informed consent. The information presented should give you a basic idea of what this research is about and what your participation will involve, should you choose to participate. It also describes your right to withdraw from the project. In order to decide whether you wish to participate in this research project, you should understand enough about its risks, benefits, and what it requires of you to be able to make an informed decision. This is the informed consent process. Take time to read this carefully as it is important that you understand the information given to you. Please contact the principal investigator Gina Martin (gmartin@athabascau.ca) or the project coordinator Tasha Roswell (troswell@athabscau.ca) if you have any questions about the project or would like more information before you consent to participate.

It is entirely up to you whether or not you take part in this research. If you choose not to take part, or if you decide to withdraw from the research once it has started, there will be no negative consequences for you now, or in the future.

This page contains information about the project, followed by a few questions to help us understand who you are which will help us best create the focus groups and will be used in analyzing the discussion topics.

Principal Investigator/Researcher:

Gina Martin, PhD

Faculty of Health Disciplines, Athabasca University
gmartin@athabascau.ca; 1-866-990-1884

Project Coordinator:

Tasha Roswell

Faculty of Health Disciplines, Athabasca University
troswell@athabascau.ca

Co-Investigators/Researchers:

Jason Gilliland, PhD
Department of Geography, Western University
jgillila@uwo.ca

Alina Cosma, PhD

CLIMATE CHANGE EMOTIONS AND FUTURE-PLANNING: EXISTENTIAL EXPLORATION

Department of Sociology, Trinity College Dublin
COSMAA@tcd.ie

Maya Gislason, PhD
Faculty of Health Sciences, Simon Fraser University
maya_gislason@sfu.ca
Kiffer Card, PhD
Faculty of Health Sciences, Simon Fraser University
kcard@sfu.ca

LOI **Letter of Information**
The purpose of this letter is to provide you with the information you need to make an informed decision about your participation in our research study. If you choose to participate, you will be asked to provide consent and confirm you are eligible.

Who is eligible to take part in this research project?
To be eligible to participate you must be aged 13 to 18 and living in Canada.

What is the purpose of this research project?
We are currently looking to better understand the feelings and emotions about climate change that are experienced by Canadian youth. Through discussion in the online focus groups, we will talk about emotions felt around climate change and the various coping strategies adolescents are using. We will also present survey questions researchers have previously used and ask for your perspectives and opinions on these. Feedback generated from these sessions will help us better understand what youth are feeling about climate change as well as guide the development of future survey questions.

What will happen during the focus group discussion and why?
The online focus group discussion will bring together approximately 5 youths (aged 13 through 18) who live in Canada to talk about feelings and emotions about climate change. Two members of the research team will facilitate the online discussions. The discussions will last approximately 1.5 hours. During this time, we will do some short introductions and then get right into the discussion. We will ask that you keep your microphone unmuted to create an easy flow of conversation. To ensure privacy, prior to having you enter the online meeting, we will disable the camera function and have you select a screen name that is not your first or last name. Before we begin, we will go over some ground rules and guidelines at the beginning of the session to make sure everyone is on the same page and to establish a safe, comfortable, and non-judgmental space for everyone to share their opinions and feelings.

How will the study information be collected and stored?
The online video will be recorded, but we will only hear your voice as the video will be

off. After that, a member of the research team will transcribe the video (type out everything that is said). Your real name will not be on the transcription and any personal information (for example, your email address) will be stored on the Qualtrics platform (the service we are using to collect this information); the Qualtrics data center in Canada is in Montreal, Quebec. Data will also be stored on Athabasca University SharePoint service and only designated members of the research team will have access this. Both of these digital sites are password protected to keep your information confidential.

Who will receive the results of the study?
The results of this study will be reported aggregately (individual data is combined to provide a big picture) in academic papers, webinars, conferences, blog posts, and on social media platforms. Anonymous quotes will be presented when showing the findings of this work, but participants' identities will not be linked to any quotes. This reporting will help to inform the broader community, both within and outside of academia, of the impacts climate change is having on youth living in Canada.

If you would like to be kept up to date on the results of the study you can inform the research team and you will receive email updates when new study results are available.

Can anything good happen to me?
This discussion will give you the opportunity to provide input on important research. Questions being developed for a measure of climate change emotions in young people will be guided by you. While this may not provide you with immediate and/or personal benefits, future young people who answer the survey questions will likely have an easier time understanding and interpreting the questions because of your input.

As a thank you for your time and feedback, you will receive a $50 e-gift card for one of four vendors. Please let us know in the short questionnaire below, which gift card you would like to receive. You will receive this e-gift card shortly after the focus group is completed. We will also provide you with a letter stating you participated in this research project, which may be beneficial for resumes and /or academic pursuits.

Can anything bad happen to me?
This online discussion session is a safe space. All comments and questions will be considered important and there is nothing you can say during this conversation that is considered wrong or silly. We intend to have fun while we get your expert opinion, but we will be talking about certain emotions that can be considered ‘negative’ or sad, as well as about climate change. This could bring up uncomfortable feelings.

Below is a list of resources for help if you do experience uncomfortable or negative feelings due to these conversations.
1. Kids Help Phone: 1-800-668-6868 (text CONNECT to 686868)
2. Mental Health Helpline: 1-866-531-2600 (toll-free)
3. Kids Help Phone on Facebook Messenger (DM @KidsHelpPhone to chat online)

Do I have other choices if I want to be involved?

If you do not wish to participate in the online focus group discussion, we will also be holding one-on-one interviews at a later time to go through some of our findings from the focus group discussions in more detail. If you prefer to participate in a one-on-one interview, you can let us know by emailing Tasha at troswell@athabascau.ca.

Will anyone know I am participating?
Your participation in this discussion and your information will be kept confidential. This means that the researchers who are asking you questions will know who you are but make a very serious promise not to tell anyone or reveal your identity to anyone. Your camera will be disabled, and you will need to select a screen name to use during the focus group to stay anonymous to other study participants.

Once the group discussion is over, we will type out everything that was said (this is called transcribing) but will not use your names. For example, if someone named Robert was a part of a transcribed discussion, had pre-selected the screen name of Sonic, and said "Climate change affects me because...", the written version would look something like this:

Sonic: "Climate change affects me because..."

Confidentiality is taken very seriously in research and steps will always be taken to ensure your privacy.

Who can I talk to about the study?
If you have any questions about the research or any concerns you need to talk through about the research, you can contact the principal researcher Gina Martin by email at gmartin@athabascau.ca and or by phone at 1-866-990-1884, or the project coordinator Tasha Roswell by email at troswell@athabascau.ca.

What if I do not want to do this?
Being a part of this discussion/research is voluntary. This means that you are free to choose whether to participate or not. If you decide to participate and then change your mind, that is okay too. You can leave the discussion group at any time and for any reason without any trouble or consequences, you will still receive your e-gift card and Letter of Participation.

If you decide you no longer want to participate during an online discussion, you may leave at anytime by exiting the focus group window. Given the group nature of focus group data, it is not possible to extract (remove) a single person's statements after the session finishes because these will be part of larger discussions. Removing one person's part of a conversation could make conversation confusing and not usable. You may still leave the session at anytime, however, the contributions you have made up until that point will remain in our transcription.

By clicking that you consent to be part of this study you acknowledge that you are willing to participate in this research project, understand what is involved in participating

and that you may leave this project at any time. You will also need to fill out the demographic questions and supply your email so that we can contact you.

Thank you for your interest!

This project has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this project, please contact the Research Ethics Officer by e-mail at rebsec@athabascau.**ca or by phone at 1-780-213-2033**.

Q3 I agree to participate in this study.

- Yes (1)
- No (2)

Q2 I am eligible to be part of this study (aged 13 through 18 and living in Canada)

- Yes (1)
- No (2)

Page Break

Page Break

Q4 What is your age in years?

- 13 (1)
- 14 (2)
- 15 (3)
- 16 (4)
- 17 (5)
- 18 (6)
- I am younger or older than the ages listed (7)

Q5 What province/territory do you live in?

- Alberta (1)
- British Columbia (2)
- Manitoba (3)
- New Brunswick (4)
- Newfoundland and Labrador (5)
- Nova Scotia (6)
- Ontario (7)
- Prince Edward Island (8)
- Quebec (9)

- Saskatchewan (10)
- Yukon (11)
- Nunavut (12)
- Northwest Territories (13)
- I do not live in Canada (14)

Q6 What city/town do you live in? *Please type below.*

_____

Page Break
Page Break

Q7 What gender do you identify as? (Select ALL that apply)

- Boy/Man (1)
- Girl/Woman (2)
- Non-binary/Genderfluid (5)
- Trans boy/Trans man (3)
- Trans girl/Trans woman (4)
- Two-Spirit (6)
- Prefer not to answer (7)
- Another identity not listed - please specify (8)

_____

Q8 Which term(s) best describe you? (Select ALL that apply)

- Arab (1)
- Black (2)
- Chinese (3)
- Filipino (4)
- Indigenous (First Nations, Metis, Inuk/Inuit) (5)
- Japanese (6)
- Korean (7)
- Latin American (8)
- South Asian (e.g., East Indian, Pakistani, Sri Lankan) (9)
- Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai) (10)
- West Asian (e.g., Iranian, Afghan) (11)
- White (12)
- Prefer not to answer (13)

- Another identity not listed - please specify (14)

_____

Page Break
Page Break

Q9 Do you, or have you in the past, participate(d) in climate activism activities (such as: Marches, Strikes, Walk-outs, Starting or joining advocacy group(s), Sharing and/or supporting climate change images/text online)

- No (1)
- Yes, please specify (2)

_____

- Prefer not to answer (3)

Page Break
Page Break

Q10 If you are not selected to participate in a focus group (this may happen if we have already reached enough participants when you have filled out this survey), would you be interested in doing a one-on-one interview at a later date?

- No (4)
- Yes (1)

Q11 Please tell us your name. This is only for correspondence and the letter of participation. Your name will not be shared with anyone.

_____

Page Break
Page Break

Q12 During the online focus groups, each participant will be asked to use a non-identifying screen name that is different from their first and last name. This is to ensure everyone's privacy.

Please indicate what screen name you would like to use during the online focus groups.

_____

Page Break
Page Break

Q13 What type of e-gift card would you like to receive after the focus group? (Please select ONE)

- $50 Amazon e-gift card (1)
- $50 Subway e-gift card (2)
- $50 Tim Horton's e-gift card (3)
- $50 Apple e-gift card (4)

Q14 Please enter your email address below; this is how we will contact you. This is also where we will send the e-gift card and letter of participation.

- Email address (1)

_____

End of Block: Project Information