



Green-minded fear: Addressing Eco-anxiety through Environmental Self-efficacy.

RESEARCH REPORT

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Declaration page

I, Tyler Kortje, declare that this research project [ethics clearance number: MAORG-24-03] is my own, unaided work. It has not been submitted before for any other degree or examination at this or any other university



Signed:

Tyler Kortje

Date: 24 February 2025

ABSTRACT

In an era where environmental and climate degradation is rampant, as a consequence of human activity, many individuals are experiencing anxiety as they begin to grasp what this means for their own future and that of future generations. The South African context provides individuals with numerous socio-economic factors that tend to cause far greater concern which may suppress the perceived severity of these environmental changes. This study aimed to examine this anxiety, known as eco-anxiety, in a sample of 218 young adults from the University of the Witwatersrand, and how the element of perceived self-efficacy plays a role in influencing eco-anxiety. The participants were recruited through online surveys that were distributed through the University's student email communication systems. The survey consisted of a demographic questionnaire, questions about eco-anxiety, and their current environmental self-efficacy. A correlational, quantitative research design was utilised to examine this relationship. The Eco-anxiety Questionnaire (EAQ-22) and the Environmental Self-Efficacy (ESE-20) were utilised for the first time in the South African context, and this study aimed to validate these scales and determine their reliability. The South African context has unique socio-cultural and economic challenges, and the research explored how this influences the perceptions and behaviours toward environmentalism. Statistical analysis was conducted, where descriptive and inferential statistics were analysed, as well as confirmatory and exploratory factor analysis techniques were utilised for scale validation in the South African context. The findings suggest that the original EAQ-22 was a valid and reliable instrument to use, however, the ESE-20 required a new structure as the original structure was not a good fit for the South African context. The findings of the Pearson correlations indicated that there was no relationship between eco-anxiety and environmental self-efficacy. Furthermore, the independent samples t-test found no statistically significant differences in eco-anxiety and environmental self-efficacy scores in terms of age, gender, or geographical location.

Keywords: Eco-anxiety, environmental self-efficacy, university students, South Africa

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CHAPTER 1: INTRODUCTION AND RATIONALE

1.1 Introduction

“I don’t want you to be hopeful, I want you to panic. I want you to feel the fear I feel every day. And then I want you to act”

–Thunberg (2019)

Greta Thunberg is a young Swedish activist whose concern for climate change started manifesting as she learned about it in school (Felsenthal, 2019). Her concern increased until it reached the point that at 16 years old, she held a protest called “School Strike for the Climate” to increase awareness of climate change (Woodward, 2019). The collective fear and panic she advocates is a call for society as a whole to take collective action for the environmental degradation that is being witnessed by millions around the world. Something that began as a single protester trying to raise awareness at school in 2018, soon became a globally united protest with over 7.6 million young adults from 150 countries (Woodward, 2019). This movement, in conjunction with Greta’s statement above, expresses the global urgency for individuals to step out of the generational complacency of ‘hopelessness’ for the state of the planet. More people need to be aware of all the rapid environmental changes that are occurring to avoid further degradation of ecological and climate systems. However, learning about this through the extensive availability of scientific evidence, and media coverage, can result in individuals experiencing heightened levels of environmental distress. However, as the climate and ecological crisis has been an issue long in the making by prior generations, the youth are increasingly becoming worried about these effects on their future.

A global study across 10 different countries conducted by Hickman et al. (2021) with 10,000 young individuals between the ages of 16 and 25, found that 59% of the responses of those surveyed indicated that they were ‘very or extremely worried’ about climate change and its impacts. Additionally, 45% of the respondents reported that the distress of climate change negatively impacted their daily life functioning. These statistics, from this multi-country study, highlight the widespread nature of what is becoming known as eco-anxiety which is experienced by the youth. Such a large-scale global study brings forth the gap in the mental health sphere that professionals need to begin recognising and addressing the effects that the distress of environmental and climate degradation has on individuals. This has ties to the way individuals take action for their behaviours, which is their self-efficacy, either motivating them

positively to change their environmental behaviours or leaving them feeling so overwhelmed to the point they believe they cannot help with combating the exacerbating conditions.

If one is to take into consideration the increasing prevalence of environmental disasters that have crossed the South African landscape over the past few years, ranging from extreme rainfall resulting in the Gauteng and KwaZulu Natal floods of 2019 and 2022 (Johnston et al., 2024), the extreme drought conditions that the Western Cape faced between 2015 and 2018 (Dube et al., 2022), or the Knysna fires of 2017 (le Roux, 2021), it is reasonable to understand the growing concern. There is a need for research to be conducted to understand its effects on South African young adults, who are grappling with the complexities of the socio-economic challenges while dealing with an ever-changing, uncertain environmental future.

Research on the concept of eco-anxiety is emerging more frequently in the international sphere (Albrecht, 2011; Clayton & Karazsia, 2020; Kurth & Pihkala, 2022), but the research on young adults in the African context is minimal. Van Niekerk (2018) conducted a study to understand how climate change affected 254 Gauteng university students' behaviour and views for the future. His study found that 90% of the student sample believed that climate change is significantly influenced by human behaviour. However, weak to moderate responses were observed when asked about their pro-environmental behaviours and whether they were concerned about environmental issues (Van Niekerk, 2018). Furthermore, a weak positive relationship was observed between the student's outlook on the future and their pro-environmental behaviours. This weak relationship results from the study sample having only a slightly positive outlook for the future of South Africa in relation to climate change.

Mugambiwa and Dzomonda (2018) used university students from rural Limpopo to gauge how much they knew about climate change using a five-point Likert questionnaire, ranging from strongly disagree to strongly agree. The study revealed that the 90 participants overall had a very low understanding of what climate change is ($M = 3.56$, $SD = 0.9$), however, they do have a good awareness of the threats it poses to their communities ($M = 4.30$, $SD = 1.23$). Furthermore, the study also revealed that students are mostly exposed to information about climate change only when they engage with materials in class or learn about it through the media (Mugambiwa & Dzomonda, 2018). Taking into consideration the work that has been done on the topic with this particular age group in South Africa, and that the aforementioned studies have laid the groundwork, the concept of eco-anxiety has not been sufficiently addressed.

1.2 Rationale

As outlined, the increasing visibility of the impacts that climate change and environmental degradation bring, instil growing anxiety for most individuals, especially young adults. This is because they are more likely to face the long-term consequences of these ongoing environmental crises. Climate and ecological change are problems that have been decades in the making; their impacts are severely getting worse and cannot be rectified overnight. With this in mind, and the growing concern, it is important to find appropriate measurement tools to assess these anxieties and develop effective interventions for young adults. Therefore, assessing these tools for the South African context could have implications for the environmental psychology field as these tools measure emotional, cognitive and physical factors, filling the research gaps by providing holistic tools for the local context. By utilising Social Cognitive Theory (Bandura, 1997), the notion of self-efficacy was used to try to understand how this would mitigate eco-anxiety in young adults.

1.3 Aim

The primary aim of this study was to investigate whether there was a relationship between eco-anxiety and environmental self-efficacy. However, before this relationship could be explored, the study had to make sure that the scales that were being used for the first time in the South African context, would be suitable tools for measuring these constructs. This was the second aim of the study, to assess the validity and reliability of the EAQ-22 and ESE-20 scales through confirmatory and exploratory factor analyses. The third objective was to explore the unique South African sociocultural and economic concerns faced by young adults, and how this created a hierarchy of priorities. Additionally, the research intended to investigate where environmental concerns are placed in this hierarchy relative to the other concerns young adults face on a daily basis. The last aim of the study was to investigate if demographic factors such as age, gender, or geographic location played a role in how young adults experience eco-anxiety and express their environmental self-efficacy.

The following chapter will first lay the foundations of the study, that being climate change, followed by a discussion of the literature on eco-anxiety. Thereafter, the theoretical framework, which is Social Cognitive Theory and its key concept of self-efficacy, is discussed with its relation to eco-anxiety. Finally, this section outlines several research questions this study aimed to answer, with the relevant hypotheses for these research questions.

CHAPTER 2: LITERATURE REVIEW

2.1 Climate Change

For the purposes of this study, it is important to understand what eco-anxiety entails. As this is a multi-faceted concept, unpacking one of the dimensions, i.e., ‘climate change’, of this concept is beneficial as it serves as the foundation for the research underpinnings of the current study. Climate change is undoubtedly one of the most well-known issues, as its impacts have consequences on a global scale (Karl & Trenberth, 2003). *Climate change* refers to how weather patterns are rapidly changing globally, and are a direct consequence of human-induced activity (Intergovernmental Panel on Climate Change [IPCC], 2007; Department of Environmental Affairs, 2012). The main contributor to climate change is the combustion of fossil fuels that leads to the emission of greenhouse gases into the atmosphere (Adedeji, 2014; Kusangaya et al., 2014).

Climate change is inadvertently resulting in disaster events across the globe. These events are categorised as either acute events (such as floods, tropical cyclones, or tornadoes), subacute events (such as heat waves or drought), and long-lasting events (such as increases in sea levels) (Palinkas & Wong, 2020; van Nieuwenhuizen et al., 2021). In research conducted by Adedeji (2014), Dasgupta et al. (2023), and Ziervogel et al. (2014), they outline that more of these long-lasting events are being observed globally, with the temperatures of the earth’s surface increasing incrementally between 0.2 and 0.65 degrees Celsius per decade, where South Africa has been seen to report temperature increases of 1.5 times that compared to the rest of the globe (Ziervogel et al., 2014). With glaciers melting, irregular precipitation and snowfall patterns, rising sea levels, the acidification of the oceans, and increased frequency of extreme droughts and floods (Adedeji, 2014; Kusangaya et al., 2014; Masipa, 2017), it is unsurprising why a growing fear of the planet’s sustainability and habitability exists. This fear, however, may not have been fully comprehended by many individuals in South Africa.

In an Afrobarometer Survey, Selormey et al. (2019) revealed that approximately 41% of South Africans had heard of climate change, whereas only 24% of these individuals understood what climate change entails and its negative impacts. This gap in climate change awareness may exist due to individuals having competing priorities with the country’s numerous socioeconomic challenges, where the perceived threats of climate change are not as pressing as issues such as unemployment, corruption, or poverty (Chersich et al., 2018; De Wet-Billings,

2023; Haq & Ahmmed, 2017). Additionally, the issue of ‘psychological distance’ contributes to the lack of awareness of climate change severity that South Africans have (McDonald et al., 2015). Climate change and its consequences have always been viewed as a distant issue, either affecting other regions of the world or something that future generations have to deal with.

This is an area of concern because the psychological distance of climate change is becoming an issue impacting South Africans more severely, as “South Africa is especially vulnerable to [climate change] impacts” (Department of Environmental Affairs, 2012, p. 5). This is due to the increased risk that it poses to countries that are burdened with poverty and inequality, as climate change has been seen to have direct impacts on food and water security, but it is also leading to the complete displacement of individuals due to the uninhabitable environments in which they reside (Adedeji, 2014; Dasgupta et al., 2023). These ‘future generations’ are the ones currently experiencing the result of this ‘disconnect’ of environmental concerns from previous generations, with the youth experiencing the highest rates of distress for the planet (Lee et al., 2020; O’Brien et al., 2018; Sanson et al., 2019).

Numerous studies show that climate change negatively impacts well-being, with children and adolescents being the most vulnerable (Clayton & Karazsia, 2020; Ediz & Yanik, 2023; Jalin et al., 2024; Rocchi et al., 2023). In unpacking this research and aligning it to the core purposes of the study, studies have highlighted that it is young individuals aged 25 and younger who are currently the group that is most susceptible to physical and psychological impacts (Ediz & Yanik, 2023). Climate activism is dominated by the youth’s presence and their surplus of climate knowledge. However, although knowledgeable, these individuals have tended to show somewhat more hopelessness toward the future (Ediz & Yanik, 2023). Children, adolescents, and young adults are exposed to climate change through indirect or direct methods, including educational interactions, media, and social conversations (Jalin et al., 2024; Maran & Begotti, 2021). These effects are underestimated, as many individuals feel psychologically distant toward climate change, and understanding how this impacts the youth is crucial for their development.

Knowledge and awareness of the detrimental effects climate change has on the planet and the population, can cause various forms of psychological distress that negatively impacts one’s well-being (Albrecht, 2011; Barnwell, 2021). Research has shown that the mental impacts of climate change manifest themselves in what Clayton (2020) describes as ‘climate anxiety.’ Climate anxiety, a more specific subset of eco-anxiety, is focused on the near-term

climate change and global warming consequences (Kurth & Pihkala, 2022) and has been synonymous with emotional responses such as ‘worry’ (Steentjes et al., 2017), ‘fear’ (Hickman, 2020), ‘frustration’ (Stanley et al., 2021), ‘sadness’ (Clayton & Karazsia, 2020), ‘powerlessness’ (Lalal & Mishal, 2021), and ‘hopelessness’ (Gunasiri, 2022). However, climate anxiety does not account for the broader and increasing existential concern felt by many, which requires a reflection on past, present and future consequences of human activity. This encompasses a reflection on biodiversity loss (Hickman, 2020), resource depletion (Hogg et al., 2024) and the impacts on future generations (Helm et al., 2024), which is known as eco-anxiety.

2.2 Eco-anxiety

Ecological anxiety, also known as ‘*eco-anxiety*’, as a construct has had much difficulty in constructing a definition as there has been minimal research conducted on the topic. Most researchers have found similarities between terms such as ‘climate anxiety’ (Clayton & Karazsia, 2020), ‘ecological distress,’ ‘environmental melancholia’ (Nayak, 2017), ‘eco-guilt and eco-grief’ (Ágoston et al., 2022; Nambiar & Singh, 2023), and ‘existential anxiety’ (Pihkala, 2020). This has led to disparities in how to define eco-anxiety, leaving it to become synonymous with these aforementioned terms. The British Oxford Dictionary has highlighted that there is a 4.29% increase in the term ‘eco-anxiety’ being searched online, from September 2018 to September 2019 (Oxford University Press, 2019). This is an indication that these intense emotions are increasingly being experienced by individuals globally, and are as a result of human-induced behaviours (Albrecht, 2011). Therefore, young adults are increasingly searching up this term, further indicating the need to understand what eco-anxiety is.

Eco-anxiety falls into a pool of many other emotions, known as ‘eco-emotions’, also referred to as ‘earth emotions’. These are essentially the emotions and responses that are elicited as a result of ecological issues and environmental change (Albrecht, 2019; Pihkala, 2022). As mentioned above, eco-anxiety has shown a relation to a range of emotions such as eco-grief, eco-depression, eco-guilt, and eco-anger. It is important to understand these eco-emotions in relation to eco-anxiety to see how individuals process and react to the ecological crisis that influences their anxiety. Eco-grief refers to the emotional response individuals feel due to witnessing the loss of the environment and ecosystems and future anticipated losses that individuals know are bound to happen (Ágoston et al., 2022). Eco-anger refers to the frustrated feelings an individual has as a response to climate or environmental change, whereas eco-depression and sadness refer to the feelings of despair and misery toward climate change

(Contreras et al., 2024; Stanley et al., 2021). Lastly, eco-guilt is the recognition that arises when individuals feel that they, or humanity in general, are responsible for playing a part in the destruction of the environment (Ágoston et al., 2022; Nambiar & Singh, 2023). Table 2.1 provides a summary of what the literature has defined eco-anxiety as:

Table 2.1: Definitions of eco-anxiety

Authors	Date	Definition
Albrecht	2011	“Anxiety related to a changing and uncertain environment...a form of ecologically induced dread [that] most likely affects many people and leads to [them] becoming distressed...” (p. 49)
APA	2020	“Any anxiety or worry about climate change and its effects”
Clayton	2020	"A chronic fear of environmental doom" (p. 68)
Davidson et al.	2023	“An emotional response evident even where there is no immediate physical evidence of impact of climate change on one’s own life. Rather, it is a projected and anticipated anxiety into the future” (p. 431)
Guthrie	2023	“Eco-anxiety consists of fears that are simultaneously catastrophic and rational” (p. 211)
Hickman	2020	“Eco-anxiety is not just an emotional response to the facts and experience of environmental crisis and threat; it includes a relationship between these emotional responses and the cognitive knowledge that we have both caused the threat and are failing to sufficiently act to reduce it.” (p. 414)
Kurth and Pihkala	2022	“eco-anxiety is an emotion that brings forms of awareness and engagement that can contribute positively to environmental stewardship and agency as well as individual and collective wellbeing” (p. 8)
Passmore et al.	2022	“persistent feelings of worry, anxiety, dread, or doom regarding environmental degradation and the impacts and implications of climate change on our planet as a whole” (p. 3)
Pihkala	2020	“A general term for anxiety in relation to the ecological crisis” (p. 2)
Wang et al.	2023	“anxiety related to the ongoing anthropogenic climate change and ecological degradation” (p. 1)

The literature has reverted to using two definitions of eco-anxiety across many research papers, which are the definitions provided by the APA (American Psychiatric Association, 2020), which define it as “chronic fear of environmental doom” and the definition provided by Albrecht (2011, p. 49) of “a form of ecological induced dread”. With all the varying descriptions of the concept of eco-anxiety, it is clear that further research needs to be conducted to clearly define what eco-anxiety truly is. In reviewing these many operationalisations of eco-anxiety by these aforementioned authors, what can be concluded is that eco-anxiety presents itself as emotional and cognitive responses that involve both an immediate and anticipatory form of anxiety and fear for the current and future state of the planet. Kurth and Pihkala (2022) provide a more nuanced and comprehensive definition of eco-anxiety which is a self-reflective, anxiety-like response to ecological threats and global warming in which individuals trigger defensive and protective responses to remedy the damage caused by human factors.

Settling on one working definition is still in the process of being conceptualised, however, what can be concluded is the consensus that the literature has reached in describing the effects of eco-anxiety on individuals. Although eco-anxiety is not officially recognised as a disorder in the Diagnostic Statistical Manual, 5th edition (DSM-5), there is a growing concern, especially in its prevalence being observed among the youth. Anxiety, as outlined by the DSM-5 (APA, 2013), is the “anticipation of future threat”. The DSM-5 does not have a specific diagnosis for eco-anxiety, however, the symptoms reported share similarities to generalised anxiety.

These emotional and physical responses to eco-anxiety include panic attacks, sadness, insomnia, obsessive thinking, hopelessness, and extreme worry (APA, 2013; Doherty & Clayton, 2011; Usher et al., 2019; Pihkala, 2020). Eco-anxiety, accompanied with intense emotions toward environmental degradation such as eco-paralysis, eco-nostalgia, and solastalgia, are what Albrecht (2011) describes as ‘psycho-terratic syndrome.’ Lutz et al. (2023) highlight that eco-anxiety can manifest as either state-like or trait-like eco-anxiety. State-like eco-anxiety refers to how individuals are able to experience feelings of worry or distress towards environmental issues on one day, but not the next. Trait-like anxiety, on the other hand, is a more permanent state of anxiety that is closely tied to one’s personal values associated with the environment (Lutz et al., 2023). Generalised anxiety tends to be paired with pervasive avoidance behaviours and poorer problem-solving (APA, 2013), however, eco-anxiety has shown to have opposite effects.

Eco-anxiety manifests as a non-pathological active form of practical anxiety that motivates individuals to take action by becoming more knowledgeable on the topic of climate change and through green sustainable behaviours (Lutz et al., 2023; Ojala, 2018; Pihkala, 2020). This practical anxiety serves as a reflection of one's character and they are able to take action to protect the things they value. Protection Motivation Theory (Rogers, 1975) is one way of understanding why eco-anxiety, unlike generalised anxiety, induces more pro-environmental behaviours. Protection Motivation Theory explains that individuals make use of adaptive behaviours to protect themselves from what they perceive as threats (Rogers, 1975). For example, Gambian subsistence farmers dealing with the consequences and potential devastating threats of climate change, use protection motivation to adopt sustainable risk management behaviours for water conservation (Bagagnan et al., 2019). Protection Motivation Theory is strongly influenced by an individual's self-efficacy beliefs (Boer & Seydel, 1996; Floyd et al., 2000) which will be discussed in more detail in the theoretical framework section to follow. On the other hand, passive coping toward eco-anxiety is one that tends to focus on recognising the problem of climate change, but avoiding it through optimism, hope, maintain normal routines with minimal adaptive responses, or the belief that "someone else will solve the problem" (Parreira & Mouro, 2023, p. 3).

Although research has not been conducted on the topic of psychological distance and eco-anxiety (Guthrie, 2023), much research has been done on climate change and anxiety and the psychological distance individuals have toward it (McDonald et al., 2015; Schuldt et al., 2018; Spence et al., 2012; Van Valkengoed et al., 2023). The psychological distance individuals experience with regard to climate anxiety will be applied to the concept of eco-anxiety, as these two terms have been shown to be synonymous with one another, as discussed previously. Psychological distance refers to the degree to which an individual cognitively removes an object from themselves (Van Valkengoed et al., 2023). The psychological distance individuals place between themselves and the ongoing climate and environmental crises can either be temporal, spatial, or social distance (McDonald et al., 2015). Temporal psychological distance, which will be briefly touched on in the current study, refers to how an individual may view climate change and its effects as something that will only happen in the distant future (McDonald et al., 2015). Spatial psychological distance is how one perceives the effects of the climate as less extreme due to it being worse in other geographical locations, such as in other low and middle-income countries, rather than South Africa (Spence et al., 2012). Although psychological distance is not the primary focus of this research study, this will be briefly touched on, to discuss climate

change in relation to numerous concerns that young South African adults have to navigate (Marais-Potgieter & Thatcher, 2022). This will be discussed in much greater detail in the next subsection to follow in this chapter.

An individual does not have to directly experience the destructive effects of ecological and climate change to have eco-anxiety. Merely being exposed to information about these issues can lead to feelings of eco-anxiety (Clayton, 2020). The media is a powerful tool that has led to increased eco-anxiety, as messages about climate change are framed negatively and instil a mind-set of fear (Achtitah & Mentak, 2022; Maran & Begotti, 2021; Passmore et al., 2022; Pihkala, 2020; Wang et al., 2023). People have the innate tendency to do research on topics that are broadcasted in the media, especially if these are topics of interest or gain an understanding on something new. However, if this information is framed negatively, it can result in avoidance behaviours as individuals feel overwhelmed, which in turn can exacerbate the effects of eco-anxiety (Jalin et al., 2024). In a study of 312 Italian university students aged 18-26, Maran and Begotti (2021) found that students were exposed to climate change information through social media, paper print, and television multiple times per week. Their study further concluded that the more attention the students paid to the information they were exposed to, the more anxious they felt about environmental issues (Maran & Begotti, 2021). Dodds (2021) states that an individual begins to experience an increase in eco-anxiety and climate anxiety the more they become informed on the topic. Different types of media, whether it is radio, video or newspaper or even social media, have some role to play in inducing or mitigating the effects of eco-anxiety. Loll et al. (2023) found that video media types have the most significant impact on eco-anxiety, where engaging with video content about climate change results in greater emotional changes pre-and-post-test of their study.

An inducing factor of eco-anxiety is the inefficient responses and information provided by social and political leaders to address these issues (Clayton, 2020; Hickman et al., 2021; Pihkala, 2022). Hickman et al.'s study (2021) concluded that across 10 countries globally, the youth express negative emotions toward their governments and the inadequate measures they have taken to acknowledge or take action to address the ongoing crises. This inadequacy has left the youth with feelings of "betrayal and abandonment" (Hickman et al., 2021, p. e871). As a collective stance, social and political action, as well as having access to the necessary resources, can play a role in building resilience that can alleviate eco-anxiety (Pihkala, 2022; Wang et al., 2023). People feel a sense of helplessness and distress as a result of those in power

not doing enough to take action, making individuals become overwhelmed due to a lack of systemic support (Pihkala, 2022), with some feeling that the failure to put measures in place to protect them and future generations is an infringement of their human rights (Hickman et al., 2021). Those living across the African continent are most vulnerable to the effects of climate and environmental change, which is why eco-anxiety is a growing concern especially when government initiatives are lacking.

The Eco-Anxiety Africa Project (TEAP, 2023) was developed by Jennifer Uchendu in 2022 to understand the African individual's experiences, vulnerabilities and emotions related to eco-anxiety. The project's approach was achieved by creating online and physical spaces to share emotions, and by offering psychotherapy support and supporting community action. This project, much like the current study, aimed to address eco-anxiety while simultaneously acknowledging how "centuries of oppression, neglect and injustice" (TEAP, 2023) influence the emotions felt toward environmental and climate change. Furthermore, the project highlights how even with these triggers, individuals are able to act on eco-anxiety through community action. This enhances the African youth's belief that change can occur through actions, even if it is as small as having a space to discuss emotions to the ongoing crises.

As a concept, eco-anxiety has few studies conducted with other constructs, even less so in the African context. Therefore, the TEAP (2023) youth survey, with 170 participants in Nigeria, is the closest conceptualisation of eco-anxiety in the African context that can be used as reference point for South Africa. The results of this survey indicated that 32.4% of the sample had heard of the term 'eco-anxiety', which highlights the fact that although this is less than half of their sample, that eco-anxiety is increasingly making its way into more conversations. Furthermore, 66.5%, once educated on the term, indicated that it was something that they could relate to. The survey also revealed that 46% of the responses showed that they needed support for dealing with their growing eco-anxiety (TEAP, 2023). The youth also indicated that there are numerous triggers for their eco-anxiety including the 'lack of action from government', 'thinking about the future', and 'ignorance displayed by the general public toward climate change'.

TEAP is a prime example of how self-efficacy, an individual's belief in their capabilities to make a change in their lives (Bandura, 1977), can affect how individuals faced with eco-anxiety are able to tackle these aforementioned triggers. Through self-efficacy, individuals can approach and try and deal with the ongoing experiences of climate change and environmental degradation to the best of their perceived capabilities through community action or tools for

self-care. The findings of this survey highlight the importance of conducting research on the topic of eco-anxiety, especially in South Africa where socio-economic factors impact experiences and self-efficacy, so that interventions can be developed to address both the psycho-emotional and action-oriented aspects of eco-anxiety.

2.2.1 Eco-anxiety and university students

In doing the literature search on aspects that directly relate to the aims of the current research study, by focusing on young adults, much of the available published literature focussing on eco-anxiety and university students were from Master's student theses and dissertations. As mentioned previously, the literature focusing on eco-anxiety specifically and not using climate anxiety interchangeably is scarce, therefore these were utilised as part of the available literature. A study was conducted on 151 participants of the age 18 to 25 at the University of Nebraska-Lincoln, in the United States of America, to assess how eco-anxiety would influence pro-environmental behaviours (Edmundson, 2024). The Pearson correlation of Edmundson's (2024) study revealed that there was a largely positive relationship between eco-anxiety and pro-environmental behaviours. The study's qualitative aspect revealed that this relationship exists due to students engaging with or thinking about climate change on a weekly basis, which has caused them a great deal of stress. This led to behaviour changes such as recycling, energy and water conservation, becoming vegetarian, joining activist groups or joining sustainable campus clubs (Edmundson, 2024). This study is a prime example of what Pihkala (2022) discusses as practical climate anxiety, and what Lutz et al. (2023) and Ojala (2018) highlight in their research of eco-anxiety as being a motivator of positive behavioural change.

In another study conducted with 374 nursing students at an Istanbul university, Mat and Yilmaz (2024) aimed to determine the relationship between the students' eco-anxiety and their awareness of climate change. The results indicated that there is a weak positive relationship between these two variables, with climate change awareness increasing eco-anxiety levels, where their study's regression analysis indicates that global climate change awareness explains 5.2% of the changes in eco-anxiety levels of nursing students. In another instance of young adults in Istanbul experiencing heightened levels of eco-anxiety, stress and depression, Er et al. (2024) found that 60.8% of a nursing student sample believed that environmental and climate change had negative effects on their health.

In an Australian study, conducted through mixed methods, on 114 students from the University of Melbourne, Kelly (2017) aimed to understand student experiences of eco-anxiety. A common theme that arose was that students who were studying a degree with an environmental major, reported anxious feelings of great concern for climate change, compared to those who were in non-environmental majors who mostly reported very low to moderate concern for climate change. Additionally, Kelly (2017) found that being connected to nature for the purposes of mental health and psychological resilience, was ‘very important’ to more than half of the students surveyed. This is in line with what studies (Birch et al., 2020; Jackson et al., 2021) discuss in explaining how young adults believe that being immersed in nature helps with improving their mental health and their overall well-being. It is important to understand the findings of Kelly (2017), as young adults develop a “stronger sense of self” (Birch et al., 2020, p.5) when connections with nature are stronger.

Environmental attitudes shape how ecological and climate anxiety manifest (Kurth & Pihkala, 2022). With the aim of understanding undergraduate student’s environmental attitudes, Evert et al. (2022) conducted a South African study with 1,139 participants at North-West University, utilising the Environmental Attitudes Inventory (EAI-24) scale, which measured constructs such as environmental preservation and utilisation. Students had higher attitudes on the utilisation factor -an anti-environmental stance. This revealed that students have lower levels of pro-environmental engagement to protect the environment, preferring to view nature as a means of human utility. Furthermore, Evert et al. (2022) found that there was a general lack of concern for the environment and the ecological crises, as students demonstrated that they did not perceive the environment to be under significant threat from activities. This was reflected in their low scores on the EAI-24 measures of environmental fragility and eco-centric concern. Understanding how environmental attitudes can result in such low scores for concern, could be a result of the numerous socio-economic concerns that South Africans have to grapple with, which is discussed later in Section 2.3.

2.2.2 Eco anxiety amongst the various demographic variables

2.2.2.1 Age and eco-anxiety

Demographic factors such as age, gender, race and geographical location influence how eco-anxiety is understood and coped with (Dlamini et al., 2022; Kirsten & Biyase, 2023; van Liere

& Dunlap, 1981). Younger generations face higher levels of eco-anxiety and climate anxiety (Ágoston et al., 2022; Clayton & Karazsia, 2020; Ediz & Yanik, 2023; Rocchi et al., 2023). This could be attributed to awareness directly related to social media, with its usage predominantly dominated by the youth being exposed to an “explosion of eco-information” (Albrecht, 2011, p. 49). Parry et al. (2022) found that 78% of 16- to 25-year-olds reported an increase in their anxiety due to social media’s climate change coverage. In their study of 1,000 Canadian young adults aged 16 to 25 years old, Galway and Field (2023) found 56% of respondents had feelings of anxiety and sadness about what is occurring with the planet; and another 73% reported that thinking about the consequences of climate change makes the future frightening. Furthermore, their study revealed that due to climate change, it has resulted in negative impacts with 78% of their participants stating that their mental health was affected by the ongoing climate crises (Galway & Field, 2023).

Gunasiri et al. (2022), using an exploratory mixed method approach with a sample of 18 to 24-year-old Australian young adults, conducted their study to understand how mental health is impacted by climate change. The study found that 89% of the participants indicated that eco-anxiety negatively impacted young people’s mental well-being, especially when they think of the future of the planet (Gunasiri et al., 2022). Additionally, to the notion of eco-anxiety, a further 83% reported that general stress and anxiety were increased as a result of climate change. In the qualitative aspect of this study, the interviews revealed quite a few contrasting narratives of being constantly exposed to environmental issues on social media. The positive impacts of social media noted by Gunasiri et al. (2022) include how it serves as a motivator as young adults are seeing how people care about the environment and change to more sustainable and reusable sources, how social media brings awareness, and building a community across the globe that has the same goal. This closely relates to what was previously discussed in section 2.2 as practical anxiety (Pihkala, 2022), where engaging with these posts online encourages positive behaviours as a result of worry and concern. Contrarily, the negative impacts of social media creates feelings of hopelessness where stories leave the youth feeling that “is what I am doing, having an effect”, anxious “I cannot do anything about this” and it is too overwhelming to the point where the youth are “trying to not follow it or have it in [their] online feed” (Gunasiri et al., 2022, p.6).

Although adaptive responses arise with eco-anxiety, such as curiosity, scepticism and worry (Doherty & Clayton, 2011), Naguy et al. (2020) highlighted that the maladaptive responses to

eco-anxiety are of growing concern. These include behaviours such as negative religious coping, substance abuse, depression, and suicidal ideation (Achtitah & Mentak, 2022; Naguy et al., 2020). These negative responses to eco-anxiety highlight the importance of studying this concept with young adults as they are vulnerable to adopting these habits. The youth, such as those of the present study aged 18-25, are susceptible to these types of maladaptive responses, especially in a country that has so many socio-economic challenges that they have to encounter on a daily basis, which will be discussed later in this chapter.

2.2.2.2 Race and Eco-anxiety

Kirsten and Biyase (2023) concluded that race plays a fundamental role in how South Africans perceive and create solutions for the ongoing environmental crises. White individuals display better environmental knowledge than other racial groups. Indian and Asian individuals have higher rates of sustainable consumption behaviours, and Black individuals tend to show greater concern for the environment (Kirsten & Biyase, 2023). Similarly, Yang et al. (2015) conducted a study in the United States using a sample of 108 university students to understand how ethnicity plays a role in environmental attitudes. The results found that Hispanic participants expressed higher levels of concern toward the environment than White individuals (Yang et al., 2015). Song et al. (2020), in their study of 1,175 participants from Amazon Mechanical Turk, have found that non-white individuals (Black and Hispanic), as well as individuals who come from low-income groups, tend to show greater environmental concern than those who come from more advantageous groups. In various Asian cultures, the historical practice of sustainable food and energy consumption due to religious and philosophical traditions allowed individuals to advocate for a harmonious relationship with nature through environmental stewardship (Kaushal, 2023; Kula, 2001; Le Duc, 2017; Mi et al., 2020). These cultural influences likely drive pro-environmental behaviours, reinforcing the role of cultural identity in shaping ecological attitudes and how this contributes to the mitigation of eco-anxiety.

2.2.2.3 Geographic Location and Eco-anxiety

Taking the demographic factors of geographical location and familial finances, Leonhardt et al.'s (2022) study in Norway concluded that those residing in urban areas expressed greater anxiety about the climate and environment crises; and those who viewed their family financial situations as “good” had a decreased risk of experiencing anxieties toward the crisis changes. Tam et al.'s (2023) research found that developing nations like China and India

experienced much higher responses to agreeing with experiencing functional and emotional-cognitive impairment as a result of anxiety related to the climate crisis. This is a clear indication that socioeconomic and political factors play a critical role in how individuals conceptualise their concerns. However, as in the case of South Africa, these socioeconomic issues of concern tend to outweigh the concerns for the environment (Marais-Potgieter & Thatcher, 2022).

2.2.2.4 Gender and Eco-anxiety

Gender has also been shown to have an impact on eco-anxiety. Utilising a different scale of measure called the Hogg Eco-anxiety scale (HEAS), Rocchi et al. (2023) found that women reported much higher mean scores than men on the ‘affective symptoms’ and ‘anxiety about personal impact’ subscales of the HEAS. These findings explain how women are more vulnerable to experiencing heightened emotional and personal concerns in relation to environmental issues. Furthermore, Man et al. (2024) conducted a secondary data analysis on cisgender boys, cisgender girls, and gender-diverse students aged 11-19 students in Ontario, Canada. Their analysis revealed that gender-diverse students reported the highest levels of eco-anxiety, with cisgender girls also reporting higher eco-anxiety compared to cisgender boys (Man et al., 2024). These are two studies that have explicitly observed gender differences with eco-anxiety.

As mentioned previously, eco-anxiety has only recently begun gaining traction as its own term that has not been used interchangeably with climate anxiety or environmental worry. However, much of the existing literature blends the conceptual definitions between the two. Thus, the following studies in the literature pool have looked at gender in relation to climate anxiety, as these were the only studies the researcher could refer back to. Wullenkord et al. (2021) found that women in their German sample reported higher climate anxiety scores than men. Young girls from a Norwegian adolescent sample of 128,484 pupils, had reported higher levels of climate-anxiety, with 14% being very worried, in comparison to 7% of boys being very worried (Leonhardt et al., 2022). The highest responses for the study showed that 44% of girls and 43% of boys were ‘a little worried’. This is an indication that although the majority of the sample expressed lower concerns toward climate change, there is still a growing concern amongst young adults globally (Leonhardt et al., 2022).

In terms of worrying about the long-term implications of all the changes arising as a result of climate change, women feel a stronger sense of responsibility toward future generations as they expressed greater levels of environmental worry and anxiety about having children in relation to the ongoing climate changes (Helm et al., 2024; Marczak et al., 2023). Tam et al. (2023) conducted research across four countries, namely Japan, China, India and the United States of America. They found that anxiety levels for environmental and climate crises were experienced the greatest by young Indian women and young men in China and the USA. All the aforementioned studies have indicated that women have displayed higher levels of climate anxiety and environmental concern. A possible explanation as to why women overall may experience higher eco-anxiety is discussed by Heeren et al. (2022) account for these differences due to the notable limitations all women globally have in societal and political decision-making processes. Additionally, women across the globe have limited access to resources and services that can assist with adapting to and making meaningful changes in relation to climate change (Heeren et al., 2022). This perspective aligns with discussions about how socio-economic issues serve as barriers to fully grappling with environmental issues.

These studies show how women tend to exhibit greater vulnerability to eco-anxiety. Ndhlovu et al. (2023) provide the reason for the African context, in discussing how Africa has the most women-headed households in rural communities, leading to much higher risks and stakes involved with environmental and climate change. Climate change has led male spouses to leave rural communities in search of jobs elsewhere, as they have to deal with eco-job losses due to the effects that climate change and ecological degradation has had on jobs such as farming and fishing. These women face a double burden of emotional and physical strain as they have to rely on natural resources for their family's survival, whilst dealing with the fears and concerns of ecological degradation and the impacts it will have on children (Ndhlovu et al., 2023). This double burden of having to deal with the everyday anxieties that require one's immediate attention, as well as simultaneously dealing with the long-term anxieties about the state of the world we live in, is something that many young adults in South Africa have to deal with.

2.3 Issues facing South African youth and factors that influence environmental attitudes.

Many studies and climate reports have highlighted that developing countries that are faced with high levels of inequality and poverty, such as South Africa, face much harsher and irreversible consequences of climate change and environmental degradation (IPCC, 2007; Department of

Environmental Affairs, 2012; Selormey et al., 2019). Although there is an awareness and knowledge of the ecological crises and its consequences, many South Africans tend to be more concerned about the degradation of the socio-economic systems of the country than they are about the future of the planet they live on. Understanding people's concerns and attitudes toward environmental and ecological crises, requires understanding the longstanding social challenges of South Africa.

Struwig (2010) highlights how apartheid has influenced South African environmental attitudes. People of colour view environmentalism as a White middle-class issue, as these individuals were the ones who enforced strict environmental policies for nature conservation. Nature conservation involved having marginalised communities forcefully removed from areas, which came with a distaste for environmental issues (Struwig, 2010). Although decades into democracy, the South African youth have not directly experienced these harsh environmental policies. However, Li et al. (2023) discuss how intergenerational transmission of environmental attitudes and behaviours acts as a mechanism through which these negative environmental emotions are passed down. Young children and adolescents are learning through their role models, which in most cases are their parents, what values and attitudes are considered as part of the norm. The youth can vicariously observe their parents' behaviours such as switching off the lights, or recycling, as a means of activating their own individual moral agency to exhibit pro-environmental behaviours (Li et al., 2023). The same holds true when young children and adolescents observe a lack of pro-environmental attitudes, knowledge, and behaviours, or a lack of eco-socialisation (Li et al., 2023) from their parents which can result in the internalisation of negative attitudes that see environmental issues as irrelevant.

In a study of South Africans aged 16 and older, by Struwig (2010) using the South African Social Attitudes Survey (SASAS) of 2005, environmental concern was assessed in relation to factors such as race, gender, geographical location, as well as other issues of importance to South Africans at the time. The results of this research indicated that South Africans viewed environmental concerns negatively, with 32.2% of South Africans agreeing with the statement that "there are more important things to do in life than protect the environment" (Struwig, 2010). In relation to service delivery issues such as sanitation, policing, roads, housing, electricity, and cleaning the environment ranked far lower than socio-economic issues. Furthermore, the study highlighted that 49.3% of South Africans agreed that too much emphasis was placed on the environment and not enough on the employment rate of the country. To

compare this to the 2020 SASAS (Human Sciences Research Council [HSRC], 2021), this number decreased only slightly to 47% of South Africans agreeing that more emphasis should be placed on jobs than the environment.

These figures are further substantiated by the research conducted by De Wet-Billings (2023) using the SASAS of 2017. In a list of 20 of the most important issues that South Africans saw as a concern in 2017, only 0.09% of South Africans had environmental issues as their most important priority, which was ranked 17th on this list (De Wet-Billings, 2023). Additionally, only 1.04% and 3.18% rated environmental issues as their second and third most important priority respectively. In 2020, an increase of 3% of South Africans saw environmental issues as their most important priority, and 5% saw it as their second most important issue (HSRC, 2021). The issues of highest concern for South Africans remained relatively unchanged over the period 2017-2020, with unemployment, health care, crime and safety, service delivery, education and HIV/AIDS being the top competing interests that outweigh environmental issues (Dlamini et al., 2022; De Wet-Billings, 2023; HSRC, 2021).

Young adults, especially university students, are faced with their own anxieties such as concerns for employment once leaving their institution. Yasar and Turgur (2020) found that 72.3% of final-year university students expressed medium-to-high concerns about unemployment anxiety. In a study conducted by Amissah and Nyarko (2017) on a sample of 18 to 35-year-old unemployed individuals, they found that unemployment was positively associated with depression and self-esteem. Although this may not be a direct link to self-efficacy, self-esteem has been found to affect one's self-efficacy (Stanley & Murphy, 1997). The unemployment rate in South Africa for individuals aged 15 to 34 is currently at 45.5% (Statistics South Africa [StatsSA], 2024). Studies have shown that for individuals who express higher intentions of long-term environmental action requires individuals to be employed and earning a source of income for purchasing environmentally friendly products, using energy-efficient appliances and renewable energy sources (Dlamini et al., 2022; Hosseinpour et al., 2015; Torgler & Garcia-Valinas, 2007; van Liere & Dunlap, 1981). Furthermore, employment in an organisation provides exposure to environmental workplace sustainability practices and policies, which employees can internalise and transfer to their own lives (Boiral et al., 2015). In their study of 284 participants across numerous Chinese companies, Song et al. (2024) concluded that ethical environmental leadership had significant positive effects on the pro-environmental behaviours of their subordinates. Therefore, as the

South African youth remain among the highest group of unemployed and do not have the necessary finances to implement changes for sustainable consumption (Kirsten & Biyase, 2023), it is evident why employment may be a greater concern.

Linking to the current study is the ongoing energy crisis in South Africa, which has left the country with the burden of load-shedding, as a result of the depletion of energy resources. Studies have shown the anxieties that load-shedding has had on student academic performance (Kgarose et al., 2023) and for learning management systems in tertiary institutions (Khoza, 2024). Although not a South African study, Malik et al. (2022) studied the effects of load-shedding on university students in India. Their study concluded that load-shedding left 71.61% of students with anxiety, and this was due to poor sleep as a result of having to work at odd hours when electricity was restored, which affected their concentration and grades. In addition to unemployment and load-shedding, there is an increasing prevalence of crime and violence in the country. Individuals tend to live in constant fear that they may be faced with becoming future victims of these crimes, ultimately living with anxiety for their safety known as Constant Traumatic Stress (Eagle, 2015). StatsSA (2024) found in a recent survey that only 34.9% of South Africans feel it is safe to walk at night, indicating that 65.1% feel that their safety is compromised when walking at night. Additionally, the number of common crimes such as theft, experienced by those who are older than 16, increased significantly from 732,000 in 2020-2021 to 1.1 million in the 2021-2022 period (StatsSA, 2022).

These aforementioned factors are just some of the many contributing factors to existing anxieties that tend to overshadow the concern for the environment. By taking these elements into account within the current study allows one to understand whether or not individuals may experience heightened levels of eco-anxiety, as an individual's attitude towards environmental concerns can be deprioritised by their immediate socioeconomic concerns. Socioeconomic and demographic factors have direct and indirect impacts on one's self-efficacy (Bandura, 2001; Han et al., 2015), which is important in understanding how one's eco-anxiety is affected.

2.4 Theoretical Framework

Social Cognitive Theory, developed by Albert Bandura in 1986, will serve as the theoretical framework on which the current study will rely to explain how self-efficacy may impact eco-anxiety. Through constructs such as modelling, self-regulation, self-reinforcement, self-efficacy and outcome expectations; SCT explains how thoughts and behaviour are influenced

by a person's environmental and their own beliefs (Bandura, 2009). SCT was chosen as a framework for this study as it has been widely used for studies across various fields of research. These include education (Martin et al., 2009; Nauta & Epperson, 2003) business (Wood & Bandura, 1989; Yoong et al., 2018), health (Rolling & Hong, 2016; Stacey et al., 2015) and most importantly in psychology (Chen & Tu, 2021; Oatley & Bolton, 1985). SCT was utilised as the current research investigated how self-efficacy paired with various internal factors (demographic factors, or climate change awareness) and external factors (geographic location, or sociocultural and economic concerns) play a role in either positively or negatively influencing eco-anxiety.

Self-efficacy, which is a key construct of SCT and this study's focus, refers to one's belief in their capabilities to perform an action to have a desired outcome (Bandura, 2009). Self-efficacy has been studied and shown as a positive influence in exercise behaviour (Bandura, 2014; McAuley & Jacobson, 1991), workplace performance (Lunenburg, 2011; Randhawa, 2004), green behaviours such as recycling (Tabernero & Hernández, 2011), energy saving (Rainisio et al., 2022), and sustainable transportation (Horiuchi et al., 2017; Redding et al., 2015). These research studies highlight Bandura's (2009) SCT processes are self-reflective and self-regulatory in nature. Action planning, a process that is self-reflective in nature, is able to mitigate the process of behavioural change (Schwarzer & Luszczynska, 2008). Individuals with higher environmental self-efficacy are able to self-regulate their eco-anxiety through action-planning and problem-solving to elicit behaviours that can alleviate their anxiety and stress (Homburg & Stolberg, 2006). To elicit some form of positive change in attitudes and behaviour, requires an individual to reflect on their current attitudes and behaviours and regulate this in accordance with an end goal. In light of this and the previous studies conducted on this topic, self-efficacy can influence behaviour change through the reflection of the emotions and physical symptoms that are associated with eco-anxiety to allow an individual to regulate their behaviours to reduce levels of anxiety.

Schunk and Usher (2012) note that self-efficacy is influenced by the social comparisons individuals make. In this sense, observing other people's responses to coping with or avoiding eco-anxieties, can either positively or negatively influence the motivation to take any form of behavioural action. This is what Bandura (2001) discusses as collective agency, where in the case of the current study, shared knowledge on the ecological crisis can contribute to collective efficacy in the form of eco-activism. One example of such collective agency is the

well-known global initiative of ‘Earth Hour’, launched by the World Wide Fund for Nature, which requires individuals to play their part in environmental activism by switching off their electricity for an hour (Chao, 2020). When individuals perceive that they are proficient at a task, due to the encouragement and social interactions one has with regard to that task, they exhibit increased motivation to work on those tasks with little difficulty.

Reciprocal determination, another fundamental concept part of SCT, refers to the interactions that occur between an individual’s personal, behavioural and environmental factors (Bandura, 1978). Personal factors are the aspects that motivate individuals to achieve things (Preko, 2017), and these include instincts, personal drives, one’s goals, knowledge and beliefs (Devi et al., 2017). Environmental factors are the external elements that impact behaviour and personal factors and include social contexts, norms, the physical environment and other individuals involved in the environment such as friends, family or community (Devi et al., 2017). Lastly, the behavioural factors are the outcomes, which can either be positive or negative, that are a result of certain actions (Abedini et al., 2023). All of these acts as antecedents for one another, or are the consequences of one another, working in tandem as a triadic bi-directional relationship (Bandura, 1978).

In the current study, personal factors such as knowledge, attitudes and past experiences of climate change and pro-environmental behaviours will affect an individual’s belief to make meaningful change. This, in turn, acts as an antecedent that results in positive behavioural changes that gets implemented into a person’s daily routine or overall lifestyle. An environment fostered by sustainable practices develops, where individual behaviours are able to inspire others, whether this be in a household, community or at a global scale (Dreyer et al., 2022). In a study of 1,589 Ghanaian participants, Preko (2017) found that personal factors such as age, gender, education and income had direct and positive effects on their green consumer behaviours. Furthermore, Preko (2017) explains that environmental factors, which for the study was environmental degradation, led participants to engage in green consumer behaviours. This highlights the triadic bidirectional feedback loop between personal, environmental and behavioural factors that Bandura (1978) discussed.

Mastery experiences, the reinforcement of one’s abilities to achieve something through regularly engaging with that behaviour, is another aspect of self-efficacy that Bandura (1997) refers to which is useful in building an individual’s environmental self-efficacy. A recent study

by Stenberdt and Makransky (2023), using a sample of 173 high school students, was conducted to assess whether immersive virtual reality (IVR) would be a useful tool that utilised mastery experiences for climate change education. Their study used IVR, mastery experiences, and waste management behaviours and the results indicated that the participant's knowledge, intentions, and self-efficacy toward waste management improved. However, as this was an immersive virtual reality study, it is difficult to say whether those pro-environmental mastery experiences would carry over effectively or similarly into reality. In another study of 280 participants conducted in Taiwan, Rahimah et al. (2018) explored how mastery can moderate death anxiety on environmental concerns and pro-environmental consumer behaviours. Their study revealed that consumers who suffer from death anxiety as a result of ecological degradation, use mastery as a means of control to manage their concern, by adopting pro-environmental behaviours in their daily lives. Thus, a sense of mastery instilled better ways of coping and behavioural change to take action, positively moderating the relationship between death anxiety, green concerns, and pro-environmental behaviours (Rahimah et al., 2018).

Bandura (1997) discusses how vicariously observing others accomplish tasks and making comparisons to oneself, can play a pivotal role in shaping one's self-efficacy. This results in the individual enhancing their beliefs in their own capabilities. In the context of environmental self-efficacy, witnessing peers, community members, or anyone that young adults see as role models engaging with environmental activism or pro-environmental behaviours, can influence those observing these behaviours to replicate them. Vicarious experiences in nature and how it positively influences environmental attitudes and behaviours in adolescents, were studied in China. The researchers, Sun et al. (2024), conducted this study using 1,476 high schoolers with findings indicating that vicarious experiences of being immersed in nature, whether through books, television programmes or taking environmental educational courses, positively cultivate adolescent behaviour and attitudes toward the environment.

Outcome expectations refer to the goals people set for themselves and the assessment of whether the consequences will be desired or undesired (Bandura, 2009). For example, recycling will have the expected outcome that it will help the earth in a positive way (Collado & Evans, 2019). According to Bandura (2009), an individual's plight to combat environmental and ecological degradation will lead them to believe that their actions, that is pro-environmental behaviours, can positively influence change which in turn leads to a desired outcome of decreasing eco-anxiety (Lutz et al., 2023; Mathers-Jones & Todd, 2023). The idea

of self-efficacy to motivate behaviour and attitude alignment with environmental concerns has led to what Moeller and Stahlmann (2019) have described as Environmental Self-Efficacy (ESE), in their development of the ESE Scale.

2.5 Environmental Self-Efficacy

In engaging with the literature, by using the advanced search settings on Google Scholar with the exact words “environmental self-efficacy and climate-anxiety”, the results produced one article (McWilliams, 2024), which was a Western Washington University Master’s student thesis. This longitudinal study’s main focus was to investigate how a hopeful climate fiction novel “A Psalm for the Wild Built” could impact readers’ climate anxiety, their self-efficacy and to understand what aspects of the text resonated with participants (McWilliams, 2024). The Google Scholar search showed similar scarcity in the results for “environmental self-efficacy and eco-anxiety” which produced one student thesis from the University of Twente (Romijn, 2023). Using a gain-loss framework, Romijn (2023) explored how eco-anxiety mediates the climate change messages presented to the public and their environmental self-efficacy. With a clear indication that the literature on eco-anxiety and environmental self-efficacy is scarce, it proves how these are underexplored in both the psychological and environmental studies fields.

Environmental self-efficacy refers to an individual’s confidence in their ability to bring about change and reduce the negative impacts of environmental degradation (Moeller and Stahlmann, 2019; She et al., 2022). This form of self-efficacy has shown to help individuals engage with pro-environmental behaviours, which serve the purpose of instilling behaviours that mitigate climate and ecological change (Abdelwahed et al., 2022; Innocenti et al., 2023; Ogunbode et al., 2022; Zebardast & Radaei, 2022). Huang’s (2016) study in Taiwan with 1,074 participants found that those with environmental self-efficacy tended to engage in more global warming media use to find information and solutions from media sources on the topics, with positive effects on promotional proactive environmental behaviours. This ties in with Bandura’s (1977) discussion on how self-efficacy is sustained with ‘mastery’ experiences, that is, becoming more knowledgeable and ‘mastering’ what one knows about the topic, motivating oneself to actively pursue behaviours that can reflect on that knowledge (Bandura, 2014).

Green self-efficacy, which the researcher found to have similarities to environmental self-efficacy, as it entails a person’s ability to take positive action to evoke pro-environmental

behaviours in themselves (Chen et al., 2014; Guo et al., 2019). Higher green self-efficacy has shown to increase pro-environmental behaviours and reducing climate anxieties in Chinese students, whereas lower green self-efficacy has shown to have the opposite effects (Qin et al., 2024). These findings align with the principles of SCT, specifically the mastery experiences element of SCT, where an individual's behaviours are highly influenced by their perceived capabilities. Higher green self-efficacy would indicate that an individual has successfully engaged with and mastered sustainable behaviours, with a likelihood of more positive personal and environmental factors resulting in higher green self-efficacy behaviours.

Incorporating the aspect of gender into positive environmental behaviours, Rainisio et al. (2022) studied how self-efficacy may induce domestic energy-saving behaviours. They found that in their sample of 155 Italian participants, gendered self-efficacy had no significant difference in energy saving (Rainisio et al., 2022). In a study conducted by Lauren et al. (2016), it was noted that amongst their high school adolescent sample in Quebec, the relationship between self-efficacy and behavioural adaptations in relation to climate change was more evident in girls compared to the boys in their study. These contrasting findings of these studies highlight the importance of how gendered perceptions around ecological and climate issues can either hinder or facilitate motivation to elicit positive changes. Furthermore, these studies highlight how reciprocal determinism of SCT, where personal factors such as one's self-efficacy or gender, and the environmental factors such as gendered norms, can influence sustainable green behaviours. The current research study intends to expand on these studies by observing how the unique environmental factors, the socio-economic factors of South Africa, as well as personal factors, such as age, gender, geographical location, and one's eco-anxiety, all influence the expression of environmental self-efficacy.

The 2020 SASAS (HSRC, 2024) indicated that from an efficacy perspective, 50% of South Africans believed that trying to save the environment was too difficult for them to achieve, compared to the mere 25% who believed that they were capable of personally doing something to help save the environment. Adding to the previous discussion on collective efficacy, 47% of South Africans believed individual efforts in engaging with pro-environmental behaviour had no impact if there was no collective action in addressing the environmental crises (HSRC, 2024). If an individual has low self-efficacy, it can lead to them displaying avoidance behaviours to their problems at hand, which in turn results in decreased motivation and increased levels of anxiety (Li et al., 2023). Zimmerman (2000) conducted a study to show the

opposite effects, where high self-efficacy in a sample of students allowed them to engage in more goal setting and planning activities which enhanced their academic performance and reduced their anxiety. This proactive approach can be applied to how environmental self-efficacy can potentially lead to adaptive problem solving that allows individuals to overcome their eco-anxiety.

However, environmental self-efficacy is often hindered by numerous barriers, especially in the South African context where young adults are faced with dealing with other socio-economic concerns. Feelings of helplessness and eco-paralysis to what is perceived as beyond an individual's control are one of the examples of psychological barriers that can hinder environmental self-efficacy. Ogunbode et al. (2022) found that excessive exposure to media narratives about climate change that are framed negatively, tends to heighten feelings of despair which hinders and reduces self-efficacy. This, in turn, results in individuals feeling that they lack confidence in their ability to effectively take action and engage in pro-environmental activities (Meinhold & Malkus, 2005). One of the biggest barriers young adults face in South Africa is the social and structural barriers that challenge one's ability to take action. Failure of the government to adequately address environmental issues, as an emphasis is placed on prioritising the economic growth of the country over conservation, can inadvertently decrease an individual's motivation to act (Lorenzoni et al., 2007). In a country with high unemployment rates with the youth, high crime rates, and lack of equal access to resources, just to mention a few of the many socio-economic concerns in the South African context, it is evident why an individual's environmental self-efficacy may be lowered to other countries globally.

Environmental concern is placed in the background, while all these immediate issues are placed at the forefront of government priorities, making individuals feel that their efforts for environmental issues are in vain due to the systemic barriers that persist. With all these barriers, how do young adults and the general population who show concern for the environment overcome these barriers? Chen et al. (2014) have highlighted how policy measures, whether this be government, organisational or community-based, can help with providing the necessary resources such as providing subsidies for renewable energy or providing store credits for buying eco-friendly products. Young adults are highly influenced by the media they engage with. By incorporating environmental issues and campaigns into the content they engage with in online social spaces is a useful approach to enhancing self-efficacy in the youth. Making use of micro-celebrities and influencers, individuals who are at closer status levels to the general population

than celebrities, can serve as role models for which young adults can visualise their belief in making changes (Stevenson et al., 2022).

In seeing how environmental self-efficacy can alleviate an individual's eco-anxiety, the concept of problem-focused and meaning-focused coping will be discussed (Malboeuf-Hurtubise et al., 2024). Problem-focused coping helps empower individuals to take action either individually or as a collective unit, to tackle issues which can help with reducing feelings such as eco-anxiety. In conjunction with this is meaning-focused coping, which is a long-term form of coping that allows individuals to acknowledge the reality they face in terms of the climate crisis (Malboeuf-Hurtubise et al., 2024). Utilising problem- and meaning-focused coping allows individuals to reframe eco-anxiety as an emotion that is overwhelming and negatively connoted, into something that is more constructive to respond to the issues of climate and environmental change. In applying these concepts of coping to the current study, van Nieuwenhuizen et al. (2021) noted that the youth's biggest coping strategy to overcome eco-anxiety is through self-efficacy behaviours of activism. This climate activism provides a sense of community where collective agency is used for political processes that benefit climate change, providing young adults with opportunities to vicariously observe others and see the outcomes of their activism. However, van Nieuwenhuizen et al. (2021) discuss how youth who come from backgrounds where they are part of a marginalised group, such as LGBTQIA+, people of colour or immigrants, tend to be the groups with the highest risk of experiencing stress and burnout through climate activism, even though they have the most to gain from activism as a mechanism of coping. This relates closely to the overlapping socio-economic issues highlighted in section 2.3, where the youth are already grappling with many other issues in relation to the ecological and climate crises.

Self-efficacy acts as a mediator for pro-environmental behaviours (Innocenti et al., 2023; Lauren et al., 2016). There is a gap in the literature for understanding how demographic factors such as race, gender or geographic location influence environmental self-efficacy specifically. As a result of the dearth in the literature, observing how these factors influence pro-environmental behaviours provides an alternative avenue to be unpacked. Kirsten and Biyase (2023) have made use of Maslow's Hierarchy of Needs (1954) to understand how South African demographic and socio-economic factors influence environmental attitudes and behaviours, where minority groups tend to shift their focus to their daily needs, instead of higher order needs like environmental issues. The study, similar to that of Burningham and Thrust (2003),

indicated that the greatest level of environmental concern comes from individuals who are among the disadvantaged populations in society. However, the highest level of self-efficacy behaviour through practicing green consumption behaviours comes from those higher socio-economic standings in South Africa (Kirsten & Biyase, 2023).

Contrarily, Sheasby and Smith (2023), found that there was no significant difference between the pro-environmental behaviours of those individuals living in rural areas or urban areas of the UK. Taking a look at developed and developing nations and how environmental concern can translate into pro-environmental behaviour, Sulemana et al. (2016) found that only 28% of African participants placed environmental protection over economic growth and employment, compared to 47% in developed nations. In a focus of urban and rural self-efficacy, Debies-Carl and Huggins (2009), in their study that focussed on understanding how one's physical and social environment played a role in one's self-efficacy and feelings of powerlessness, found that individuals in urban areas tend to have much higher self-efficacy compared to those that permanently reside in rural areas. Furthermore, Sulemana et al. (2016) concluded that among developing nations, Rwanda had the highest preference for environmental protection with a response of 57.73%, compared to South Africa with 19.70%. The findings of the study align with the argument made that young adults in South Africa have numerous concerns that take precedence in their lives over what is perceived as a long-term concern such as environmental issues.

In a qualitative study conducted in Poland on the 'Gen Z' population, young adults aged 16 to 19, Dąbrowski et al. (2022) identified 7 forms of pro-environmental behaviours that Gen Z youth have implemented to take action against climate change. These included making use of second-hand stores to make purchases, waste segregation, saving resources, plastic reduction, frequent use of public and eco-friendly transport, and engaging in climate activism and protests. In this study, although not directly using Bandura's (1977) SCT framework, the interviews conducted by Dąbrowski et al. (2022) highlighted critical aspects that result in environmental self-efficacy. Participants highlighted how engaging with friends, family, and social media influencers online, and observing their behaviours results in them learning new green behaviours. Seeing grandparents in the rural area make use of bicycles to travel, or watching parents separate waste and recycle enhances one's belief in themselves to do these as well (Bandura, 1997).

Reflecting on the studies of Maran and Begotti (2021), Pihkala (2020) and Wang et al. (2023) who have discussed how the information online and the media make individuals more anxious about environmental issues, contrasting views have been highlighted by Dąbrowski et al. (2022), Petersson-Eid et al. (2024) and Sham et al. (2024). The participants of these three studies have indicated that it is as a result of the media, specifically social media influencers, who help encourage pro-environmental behaviours such as buying from second-hand stores and participating in climate protests. In terms of mastery experiences, the participants highlighted that the observed behaviours were learned over time and incorporated into their own lives. For example, participants mentioned observing behaviours such as waste separation from their mothers growing up and have begun doing so unconsciously when throwing out the rubbish. Furthermore, young adults have mastered swapping out plastic shopping bags with reusable material bags when going to the store (Dąbrowski et al., 2022; Sham et al., 2024).

In line with the objectives of this research, self-efficacy serves as a crucial factor in determining how individuals come to terms with anxieties that arise with ecological changes. As mentioned, the emotional responses to ecological changes can either help in decreasing one's eco-anxiety or they can exacerbate it.

To bring all these aforementioned elements together, numerous studies were examined to understand where research has been conducted on the topic of 'eco-anxiety and self-efficacy'. After consulting the available literature, it was evident that this topic of climate change anxiety and general self-efficacy is prevalent in countries of the Global North such as Italy (Innocenti et al., 2023; Maran & Begotti, 2021); Germany (Reese et al., 2023); Netherlands (Romijn, 2023); and North America (Coppola, 2021; Nutkiewicz et al., 2023). These studies show the evident need for research to be conducted on the emerging topics with a focus on *environmental self-efficacy*, especially in the Global South and in countries such as South Africa, where the burden of socio-economic inequalities makes combating and understanding issues such as eco-anxiety more difficult. The goal of the current study is to address this research gap and contribute to the existing literature by adding an understanding from the perspective of young adults' eco-anxiety and environmental self-efficacy in South Africa to the body of knowledge that exists.

2.6 Research Questions

1. Is the EAQ-22 structurally valid and reliable in the South African context?
2. Is the ESE-20 structurally valid and reliable in the South African context?
3. How important are environmental issues to young adults in South Africa, in comparison to other issues?
4. Is there a correlation between eco-anxiety and environmental self-efficacy?
5. Which demographic group (gender, age and geographic location) experiences greater levels of eco-anxiety and environmental self-efficacy in the South African context?

2.7 Hypotheses

1. The original EAQ-22 will be structurally valid and reliable for use in the South African context
2. The original ESE-20 will be structurally valid and reliable for use in the South African context
3. Environmental issues will not be viewed as important in the South African context compared to other existing concerns
4. There is a negative relationship between environmental self-efficacy and eco-anxiety where those with:
 - Higher environmental self-efficacy will correlate with lower levels of eco-anxiety.
 - Lower environmental self-efficacy will correlate with higher levels of eco-anxiety.
5. There will be significant differences in eco-anxiety and environmental self-efficacy scores between male and female participants; between those younger than 25 and older than 25; and between those from urban and rural areas.

2.8 Conclusion

This chapter offered a comprehensive exploration of the eco-anxiety and environmental self-efficacy constructs. The literature, although scarce, has highlighted the need for addressing the ongoing ecological and climate crises through an approach that also considers the unique socio-economic context of South Africa.

The chapter initially explored the global impact that climate change has on ecosystems, which was then narrowed to focus on the long-lasting impacts it would have on the South African population. This was important to understand, as developing nations like South Africa where poverty and inequality are most likely to be vulnerable to this crisis, which ultimately impacts the attitudes and behaviours toward eco-anxiety. Additionally, a discussion on eco-anxiety as a recently growing psychological phenomenon took place within this chapter, where a definition and the symptoms were outlined. This brought about a discussion on how eco-anxiety can be seen both as a stressor as well as a motivator for change, leading to environmental self-efficacy as a means of fostering positive environmental behaviours and coping mechanisms. The literature showed how those with higher self-efficacy were more confident in their abilities to engage in meaningful actions. Finding ways to measure these constructs holistically so that eco-anxiety could be addressed constructively and to enhance young adult's environmental self-efficacy became the core focus of the study. This led the researcher to use the EAQ-22 and ESE-20 instruments, with the aim of establishing validity and reliability in the South African context (research questions 1 and 2), as well as understanding the relationship between these two constructs (research question 4), so that it could be utilised as a tool for interventions, educational campaigns, organisational policies or even community efforts.

The literature highlights the critical research gaps in terms of eco-anxiety and environmental self-efficacy as a whole, but even more so in the Global South with countries such as South Africa. The current study aims to contribute to this gap and the overall discussion on these constructs, from the perspective of how young South African adults are able to navigate the environmental crises while dealing with the ongoing socio-economic concerns. Understanding what young adults prioritise in terms of their issues of concern in relation to environmental issues, led the researcher to develop research question 3.

This chapter has also outlined the different variations in eco-anxiety and self-efficacy where younger individuals, particularly women and gender-diverse groups, exhibit the highest levels of worry and anxiety globally. This led the researcher to consider what the potential differences in the gendered aspects of eco-anxiety and environmental self-efficacy would be, which led to the development of research question 5.

CHAPTER 3: METHODS

The purpose of the methods chapter is to provide a detailed description of the research design of the current study, discussing the sample, how it was collected, and the instruments used. Furthermore, this section outlines the procedures utilised for data collection, the ethical considerations, as well as the data analysis and techniques.

3.1 Research Paradigm and Design

A research paradigm reflects a researcher's worldview and how their views are able to inform knowledge creation and the interpretations of their research (Kivunja & Kuyini, 2017). As the current research aimed to objectively and deductively quantify new scientific knowledge to discover a relationship between eco-anxiety and environmental self-efficacy, it aligned itself with the positivist paradigm (Park et al., 2020; Terre Blanche et al., 2006). Within the positivist paradigm, researchers do not intend to affect what is being observed, aiming to study phenomena as naturally and independently existing from them (Rehman & Alharthi, 2016).

To effectively apply the positivist paradigm to the research study, the research design needed to align with its principles of quantification, causality, objectivity, and following the hypothetico-deductive model (Park et al., 2020). In conducting this research, the data collected was quantified and statistically analysed, therefore this study utilised a quantitative research design. This was selected as the choice of research design as quantitative studies are able to objectively and numerically represent and capture real-world phenomena by observing behaviours through quantifiable variables (Ahmad et al., 2019). Furthermore, the quantitative approach was selected as it has been the choice of design adopted by many other anxiety and self-efficacy-based studies (Raath & Hay, 2016; Sarrasin et al., 2022). Although qualitative designs offer data-rich and subjective insights into phenomena, the quantitative design has the strength of offering generalisable outcomes to much larger populations (Choy, 2014).

The data collection was obtained in a once-off online questionnaire, making this research cross-sectional in nature. Cross-sectional research offers researchers a 'snapshot' of participants' behaviours and psychological states in a single time period (Wang & Cheng, 2020). Although cross-sectional studies offer the benefits of being inexpensive to conduct and allow the researcher to collect data for all their study's variables at one point, it has the limitations of non-response bias and does not allow for causal inferences to be made (Wang & Cheng, 2020).

As the study had no manipulation of the variables and did not intend to make a comparison between a control and experimental group, and there was no random assignment, this study was classified as a non-experimental design (Kramer et al., 2019). The non-experimental nature of the research allowed the researcher to examine relationships that occurred naturally, without having the concern of unethical manipulations. This was important in the current research study as manipulation of either variables of eco-anxiety and environmental self-efficacy could have negatively impacted the participant's well-being (Kramer et al., 2019). The quantitative, non-experimental design was employed through the use of a questionnaire, which is discussed in more depth in the sampling section. The limitations of non-experimental research are that selection bias may arise due to the non-random selection techniques, as well as the possibility of alternative explanations arising due to the lack of control that non-experimental research has for extraneous variables (Breugh, 2008). Furthermore, non-experimental research does not allow inferences of causality to be made because there is no comparison between treatment and non-treatment groups to explain relationships (Kramer et al., 2019). The data collected aimed to investigate the relationships between eco-anxiety and environmental self-efficacy, therefore the current study examined the extent to which these two variables relate to one another (Seeram, 2019), and hence the research is correlational in nature.

3.2 Measuring Instruments

For this research, three instruments were utilized namely, a self-developed demographic questionnaire, the Eco-Anxiety Questionnaire, and the Environmental Self-Efficacy Scale. The following discussion provides a brief background on the instruments and their reliability from previous studies. The reliability for these scales was only established once analysis had taken place.

Before participants accessed the survey, a participant information sheet (PIS, Appendix H) was provided for consent to participate. The PIS explained the nature of the study, its purpose, and what was required from the participant. The PIS contained information regarding how anonymity and confidentiality were maintained. It also informed participants of their right to withdraw and provided information about the free counselling offered by the university if any distress was felt after completing the survey. The online questionnaires asked participants to provide their responses to questions by means of selecting the appropriate radio button controls in either list form or in a matrix of items and choosing from drop down options. The Likert

scales used (ESE-20 and EAQ-22) prompted participants to answer each statement in terms of their level of agreement or disagreement.

3.2.1 Self-developed Demographic Questionnaire

The self-developed questionnaire (Appendix A) aimed to obtain the demographic information of the participants, which included information regarding their age, gender, race, employment, the type of high school attended and permanent residence geographical location, and questions about their current concerns in relation to the ecological crisis.

The questions about young adults' current concerns asked participants to evaluate their concerns for these issues by ranking them in order of current importance to them, from 1 to 10. These concerns drew on Marais-Potgieter and Thatcher's (2022) study. The options provided for this question included diverse and inclusive examples to provide a better understanding for participants to make their ranking choices. The 10 issues listed include international tensions (e.g. war), social concerns (e.g. poverty, gender-based violence, and inequity), environmental concerns (e.g. global warming, ecological disasters), personal issues (e.g. academics, identity, sexual orientation), economic concerns (e.g. post-graduate employment, cost of living), health concerns (e.g. cancer, HIV/AIDS, Covid-19), religious concerns (e.g. prayer, sinning), political concerns (e.g. xenophobia, load-shedding), and personal safety issues (crime, violence).

A pilot test was conducted for the demographic questionnaire to ensure clarity and functionality, with particular reference to the section pertaining to these young adult concerns. This was important to gain feedback, as the functionality of the REDCap instrument design needed to allow only one option to be selected per column from the instrument matrix. A pilot study was conducted using students who had already graduated from the university, between the ages of 22-25. This group was used to ensure that no current students would be part of the pilot as they would be able to change their responses in the final survey. After receiving feedback from 8 pilot participants, the demographic questionnaire was considered to be clear and coherent. However, 5 out of the 8 individuals did find that the section pertaining to the ranking of young adult current concerns needed some revisions in the instructions provided. This feedback led to refining the questionnaire by rephrasing instructions and providing an example for clarity purposes.

3.2.2 The Eco-Anxiety Questionnaire (EAQ-22)

The Eco-Anxiety Questionnaire (EAQ-22), developed by Ágoston et al. (2022), is a 22-item scale that assesses an individual's feelings, thoughts, and reactions to environmental conditions such as climate change, global warming, ecological degradation, and species extinction. Based on subjective judgement this scale presented good face validity and content validity as it covered a comprehensive range of symptoms and experiences associated with eco-anxiety. As the EAQ-22 was developed in English, and the official teaching language at the University of the Witwatersrand (WITS) is English, no language adaptations were made.

The EAQ-22 consists of two subscales, named the 'Habitual ecological worry' subscale (made up of items 1, 2, 4, 6, 7, 9, 11, 12, 14, 15, 17, 19, and 20), and the 'Negative consequences of eco-anxiety' subscale (consisting of items 3, 5, 8, 10, 13, 16, 18, 21, and 22). The EAQ-22 is a self-administered 22-item questionnaire rated on a balanced four-point Likert scale, ranging from 1, '*strongly disagree*', to 4, '*strongly agree*'. After computing total scores, the overall scores range from 0 to 88. The habitual ecological worry subscale is made up of 13 items, which all relate to the adaptive aspect of eco-anxiety. The negative consequences of eco-anxiety subscale consists of 9 items, which focuses on the distressing aspect that causes various symptoms that impact well-being. Examples of items include 'I sleep poorly because I keep thinking about climate change' and 'I am so anxious about climate change that it affects my performance at school/work' (Ágoston et al., 2022). Higher levels of habitual ecological worry and more negative consequences of anxiety are related to higher scores on each subscale (Ágoston et al., 2022).

Ágoston et al. (2024) have utilised the EAQ-22, with their study yielding excellent reliability of the Habitual ecological worry subscale ($\alpha = .91$) and good reliability for the Negative consequences of eco-anxiety subscale ($\alpha = .86$). Petkovski (2024), in a cross-sectional study of 311 German and Dutch participants, showed excellent reliability ($\alpha = .93$) for the overall EAQ-22 scale. Zeier and Wessa (2024) translated and validated the EAQ-22 to German, using a sample of 871 participants, and were able to produce internal consistencies similar to that of Ágoston et al. (2024). Their validation did not provide the reliability of the overall EAQ-22, however, the two subscales showed good to excellent internal consistencies for habitual worry ($\alpha = .93$) and negative consequences of eco-anxiety ($\alpha = .86$). In another validation study of the EAQ-22 using a French sample, Micoulaud-Franchi et al. (2023), after conducting exploratory factor analysis, found that the overall EAQ-22 yielded excellent reliability ($\alpha = .93$).

3.2.3 Environmental Self-Efficacy Scale

Based on the literature and Bandura's (1977) framework of self-efficacy, including mastery experiences, vicarious experiences, verbal persuasion, and physiological states; the researcher thought it would be best to find a measuring instrument that could relate concepts to environmental self-efficacy. This led to the researcher finding the Environmental Self-efficacy Scale (ESE-20).

The Environmental Self-Efficacy (ESE) Scale is a self-report measure developed by Moeller and Stahlmann in 2019 (Appendix C), which has two versions: the ESE-10 and the ESE-20. For the current study, the ESE-20 scale was utilised, as it is more holistic and comprehensive. The original ESE scale consisted of 21 items, however, Moeller and Stahlmann (2019) removed item 19 due to low factor loadings in their Exploratory Factor Analysis (EFA) which decreased internal consistency. The scale consists of 20 items, measured on an 11-point Likert-type scale, ranging from 0 (*cannot do at all*) to 10 (*highly certain I can do*), where 5 (*moderately can do*) is a mid-point anchor in the rating. The scale is in English which was appropriate for the participants as the University's teaching language is English. However, adaptations were made to the wording of the anchors. For clarity purposes, for example, 0 'cannot do at all' was reworded to 'no certainty at all'; 5 'moderately can do' was rephrased to 'moderately certain' and 10 'highly certain can do' became 'completely certain'. Scores range from 0 to 200, with higher scores indicating greater environmental self-efficacy.

Based on the researcher's understanding of self-efficacy, the researcher was able to notice various items that related to the aspects that make up self-efficacy. For example, item 9 "I can help preserve the quality of the water" and item 11 "I can reduce the negative impact I have on the planet" were examples of mastery experiences. Furthermore, item 6 "I can be as environmentally friendly as most people in my community" and item 18 "I can set an example of environmentally friendly behaviour for others to follow" were understood to be vicarious experiences. For physiological and emotional states, item 15 'I can continue being environmentally friendly even when faced with financial burdens' and item 16 "I can continue being environmentally friendly even when I'm having a bad day" were identified. Lastly, outcome expectations were seen in item 8 "I can choose forms of transportation that cause fewer carbon emissions" and item 10 "I can choose to be an environmentally friendly consumer". This led to the decision to utilise this as a measuring instrument.

A study by Cosio et al. (2023) made use of the ESE-10 to investigate whether the use of PC games or immersive Virtual Reality (VR) would improve environmental self-efficacy in a sample of 105 participants, found that the ESE-10 yielded Cronbach alpha coefficients of .91 (pre-test value) and .88 (post-test value). In a study to understand how environmental concerns, communal orientation, and environmental self-efficacy predict the pro-environmental purchasing behaviour of young adults, Singh and Khanwani (2023) found good reliability ($\alpha = .88$) for their use of the ESE-20. A study by Sorour et al. (2025) in Egypt aimed to explore the relationship between climate change knowledge, environmental self-efficacy, and pro-environmental behaviours. This study found that the ESE-20 had excellent reliability in their study ($\alpha = .94$).

3.3 Sampling and Sample

The population for this study consisted of students from WITS. The growing prevalence of eco-anxiety in young adults has been seen as an area of importance, with studies such as Clayton and Karazsia (2020) reporting that young adults in the United States aged between 18 and 35 years report much higher scores in climate anxiety in comparison to older participants, which impacted their daily functioning. Ediz and Yanik (2023) found that Turkish individuals aged 18 to 24 have higher levels of climate change knowledge and experience higher levels of hopelessness. The younger generation experiences more concern about the effects of these climate and environmental changes left on them by older generations. Therefore, the current study aimed to make use of university students, aged 18-25 years old.

The study made use of a non-probability, volunteer-convenience sampling method. This method allowed participants to make the choice of deciding to partake in the study themselves (Vehovar et al., 2016). The technique has the benefits of being cost-effective and easy to implement (Acharya et al., 2013). Non-probability sampling does not allow for an equal chance of being included in the current research, thus having the limitation of not necessarily being representative of the population (Acharya et al., 2013; Laher, 2016). As this may not be a representation of all university students, the findings may not necessarily be generalised to all young adults who have and are experiencing eco-anxiety. This is an important aspect to note when interpreting the results, as university students are more likely to have a unique awareness of the climate and ecological issues as compared to other demographic groups.

To gain access to this sample of students, a permission letter was written to the WITS Student Research Registrar requesting that this study be conducted with students (refer to Appendices E and J). An email with a secured link to the survey was distributed to all the university students. According to the WITS student statistics for 2023, a total of 41,270 students were registered for the academic year, of which 24,964 were undergraduate and 16,306 were postgraduate students (University of the Witwatersrand, 2023). In a preliminary biographic report for the 2023 cohort composed by the WITS Analytics and Institutional Research Unit (AIRU), the ages of registered students were shown to be 24% are below 18 years old, 75% are aged 18 to 22 years old, and 1% are aged 23 and older (AIRU, 2024). Based on these figures, and ethical considerations, the researcher tried to estimate the number of students who are roughly aged between 18 and 22, as this is the closest age demographic to the current study. With 75% of the total 41,270 students, it was found that 31,365 students are aged 18 to 22, which helped in calculating the proposed sample size.

Firstly, using Israel's (1992) Table of Sample Sizes as a guide, suggests that with a population greater than 25,000, with a precision level of 5%, a sample size of 394-397 is required. To gain further insight into the proposed sample size for this study, an online Raosoft sample size calculator software was utilised to calculate the sample size. After setting the margin of error to 5%, the confidence level to 95%, and inputting the aforementioned WITS student population of 31,365, the sample calculator recommended a sample of 370. Therefore, the proposed sample size for this study was to gather at least 300. As this is a relatively large sample, this meant that the effect sizes would be moderate. The sample size indirectly affects the expected effect size, where an increase in the sample size will result in an increase in the effect size (Serdar et al., 2021).

After checking that the survey was set up correctly, a public distribution link was obtained, which would be sent to the University student registrar to distribute via student emails. Communication between the researcher and student registrar liaison required documentation such as the ethics clearance certificate (Appendix D), Form A that requests access to student samples (Appendix F), as well as the survey. Once access was approved, an email was distributed via the university's online email communication system on Friday, August 29, 2024, which sent out an announcement to 39,310 students to request their voluntary participation (Appendix G). The email contained a brief introduction with a link to the survey, and the researcher and supervisor's contact details. The survey immediately displayed the PIS

for participants to read and provide their consent. Thereafter, the three respective questionnaires were displayed for completion.

In communicating with the Faculty registrar research staff, it was communicated that reminder emails to encourage participants to complete the survey would not be disseminated. The communication stipulated that the initial invitation would be the sole communication sent out. To reach as many students as possible to participate in this study, the researcher made use of social media to attract a higher number of participants. This entailed making use of platforms such as WhatsApp statuses and posting on LinkedIn. To employ this method of attracting participants, the researcher had to create a digital flyer (Appendix I), which contained information about the purpose of the study, and the criteria for participation (being a currently registered WITS Student, aged between 18-25 years old). The flyer also contained the link to the survey, as well as a QR code that participants could scan to access the survey as an alternative to the direct link. Furthermore, the researcher and supervisor's contact details were provided on the flyer for participants' queries.

This research poster flyer was posted on WhatsApp statuses, which the researcher sent out to their contact list, asking for volunteers to anonymously participate in the survey. The researcher ensured that the ability to see WhatsApp status viewers was turned off to ensure that anonymity was maintained to an extent. Thereafter, the researcher utilised LinkedIn to post the flyer to the researcher's network which consisted mainly of students from WITS. Additionally, when the number of responses started to stagnate, the researcher reached out to the Psychology Third Year and Honours Course Coordinators, and requested their assistance in distributing the survey link to their students on the Ulwazi Course Announcements.

Once the survey was closed, the researcher downloaded the raw data from REDCap. The raw data captured 374 responses. Among these responses, included 58 participants who only clicked "Yes" on the consent form in the Participant Information Sheet (PIS) without completing any other sections of the survey. Additionally, 49 participants only completed the demographic questionnaire, while another 49 participants completed the survey up until the EAQ-22, but did not complete the ESE-20. This resulted in 156 incomplete survey responses. Therefore, the researcher was left with a total of 218 complete responses, from participants who completed all three of the required questionnaires.

In a total sample of 218 student participants from WITS, it was observed that the frequencies were disproportionate as the sample had more female respondents (72.5%, $n = 158$) compared to male respondents (25.7%, $n = 56$), those who preferred not to say (0.9%, $n = 2$), and those who identified as other (0.9%, $n = 2$). The majority of the sample were racially classified as Black (62.4%, $n = 136$), with the remaining participants identifying as White (17.4%, $n = 38$), Coloured (6.4%, $n = 14$), Indian (11.9%, $n = 26$), and Asian (0.5 %, $n = 1$). Additionally, 0.9% of the respondents identified their race as other ($n = 2$) and 0.5% preferred not to disclose their race ($n = 1$). Participants in this study ranged in age from 18 to older than 25. The largest group of responses came from individuals older than 25 (34.9%, $n = 76$), with the smallest number of responses coming from those aged 24 (5.5%, $n = 12$).

When asked about their highest level of education, most respondents had attained their Matric (grade 12), indicating that these individuals are currently in the process of completing their undergraduate degree (39.9%, $n = 87$). The highest education level for the rest of the sample included a Bachelor's degree (23.4%, $n = 51$), an honours degree (22.5%, $n = 49$), a Master's degree (11.9%, $n = 26$) and other forms of higher education (2.3%, $n = 5$). The employment status of the respondents varied, with 61.0% ($n = 123$) reporting that they were not employed, while 31.2% ($n = 68$) reported being employed full-time, and 7.3% ($n = 16$) were employed part-time. Most of the respondents indicated that they resided in urban areas (45.3%, $n = 81$), followed by those living in semi-urban areas (28.5%, $n = 51$), townships (17.9%, $n = 32$), and the least number of responses indicating that their location of permanent residence was in rural areas (8.4%, $n = 16$). In terms of schooling, the most attended form of schooling was public/government schooling (68.3%, $n = 149$) followed by private schooling (31.7%, $n = 69$). The researcher did include two other forms of schooling, namely home-schooling and alternative learning schools such as Montessori schools, however, no participants filled these in.

Table 3.1: Descriptive statistics of the sample

Variable	Frequency	Percentage (%)
Gender		
Male	56	25.7
Female	158	72.5
I prefer not to say	2	0.9
Other	2	0.9
Age		
Younger than 18	0	0.0
18	16	7.3
19	23	10.6
20	23	10.6
21	21	9.6
22	13	6.0
23	16	7.3
24	12	5.5
25	18	8.3
Older than 25	76	34.9
Race		
Black	136	62.4
White	38	17.4
Coloured	14	6.4
Indian	26	11.9
Asian	1	0.5
Other	2	0.9
Prefer not to say	1	0.5
Area of residence		
Urban	97	44.5
Semi-urban	58	26.6
Township	44	20.2
Rural	19	8.7
Employment status		
No	133	61.0
Yes, Full-time	68	31.2
Yes, Part-time	16	7.3
Yes, occasional	0	0
Schooling		
Public/Government	149	68.3
Private	69	31.7
Home Schooling	0	0
Alternative schooling	0	0
Highest level of education		
Matric (grade 12)	87	39.9
Bachelor's degree	51	23.4
Honours degree	49	22.5
Masters degree	26	11.9
Other (diploma, higher certificate)	5	2.3

3.4. Procedure

For research to be conducted, ethics approval had to be obtained from the University of the Witwatersrand's Human Research Ethics Committee (HREC). Ethical clearance was applied for by submitting a research proposal to the HREC and was granted (ethics clearance protocol number: MAORG-24-03, Appendix D). Once this was granted, the University's student

research registrar was contacted to formally request permission for the distribution of the online surveys to the sample via the University's email database system to invite participants (Appendix E). Online surveys are a popular research practice, offering the benefits of being inexpensive, easy response collection, and decreased turn-around time (Evans & Mathur, 2018).

The survey was set up on REDCap, which was accessed after sending an application form, to the REDCap Admin Team, to request an account to be created. After the administration team provided access to utilise the platform for this research study, the researcher was able to navigate the platform to search the platform's Shared Library of existing instrument repositories to see if the EAQ-22 and ESE-20 were available to download for use. However, as these were not listed in the repository, they had to be manually imported by the researcher onto REDCap. The questionnaires, which are the Demographic questionnaire, the EAQ-22, and the ESE-20, as well as the PIS, were all created by the researcher using the REDCap online designer tool.

Once these were set up, the researcher piloted the survey by sending a link to the supervisor as well as to the researcher's private email. This was to ensure that the survey functioned correctly in terms of question logic, but also to ensure device compatibility, i.e. mobile phones, laptops, and desktops. The researcher then conducted a pilot study with 8 individuals, who fell within the same age range of the research study sample, and who volunteered to be part of the pilot study to test the quality and functionality of the entire survey. Pilot testing plays an essential role, especially in scenarios where a research instrument needs to be tested in a new context, but it also helps the researcher by having additional people identify mistakes or provide feedback on ambiguous or unclear instructions (Cooper & Schindler, 2014). Feedback was received, and minor revisions were made to enhance clarity. Thereafter, the survey link was distributed via the University's email database system inviting the students to participate. The link directed participants to the REDCap survey window, which immediately displayed the PIS for their consent by selecting "Yes" or "No". Those who selected "No" were immediately excluded from the survey and the browser refreshed. For those who provided consent, this was followed by the three questionnaires.

The data collection process began on the 29th of August 2024, following ethics approval, and the survey remained accessible and active for a period of 4 weeks. After communicating with the research supervisor, it was agreed to close the survey on the 27th of September 2024.

3.5 Ethical Considerations

Before any research could be conducted, the researcher had to obtain ethical clearance (Appendix D) from the respective institution's review board (Connelly, 2014). An ethics application was submitted to the WITS' Human Research Ethics Committee (HREC), as the current research study involved human participants. Once the HREC had given clearance, the following ethical principles had to be adhered to throughout. After completing an ethics training online course (Appendix M), the researcher was able to apply the principles learned to the study. The principle of informed consent, which should be given voluntarily by the participants (Arifin, 2018), involved providing the participants with an accurate and thorough explanation of what the research entailed. This was achieved through the Participant Information Sheet (PIS), which had details regarding the research purpose, the researcher and supervisor's contact information, and the affiliated institution, with clear stipulations on the research procedures and how confidentiality and anonymity would be maintained, as well as information regarding the potential benefits and risks of the study. On the PIS, a tick-box was provided to obtain participant consent (Connelly, 2014). This was required to be completed by selecting either the option 'Yes' or 'No', where those who selected 'No' were automatically excluded from the survey. Participant anonymity and confidentiality were maintained through the REDCap platform, which ensured that no identifying information was captured, that all responses were encrypted, that no IP addresses were tracked, and only used participant IDs (numbers allocated from 1 to 218). To further ensure that anonymity and confidentiality were maintained, only aggregate data was reported.

To ensure participation was based on intrinsic motivation, the research study offered no financial or material incentives to the participants. The only benefit that participants were made aware of was the contribution that their participation would have in terms of the educational value and for future mental health care policies and programmes for eco-anxiety. Furthermore, the researcher had to make it clear to the participants that they had the right to withdraw from the research process up until the point of completion of the questionnaires (Arifin, 2018; Cacciattolo, 2015). Once responses were submitted, it was not possible to remove responses as these were submitted anonymously. The collected data was protected and stored securely on a password-protected laptop which only the researcher knew the password to and had access to (Connelly, 2014). This study did not intend to cause any psychological harm to the participants. However, as a precautionary measure, participants were provided with the contact information for the free university counselling services at the Emthonjeni Centre on East

Campus. Lastly, participants were made aware that the research findings could be used as secondary data for future research, and their consent to this would need to be obtained as well.

3.6 Data Analysis

Once the data collection process ceased, the responses were downloaded from REDCap to an Excel spreadsheet. This Excel spreadsheet was checked for duplicate responses, coded, and any necessary items were reverse scored. For this study, no items were required to be reverse scored. Thereafter, this Excel spreadsheet was imported into the IBM Statistical Package for the Social Sciences (SPSS) version 29.0.2.0. After going through the data set, it was noted that a few of the items for the EAQ-22 and ESE-20 scales contained missing values. The missing responses had no pattern, and the cases that had missing values were indistinguishable from those that were complete. This means that these missing values were Missing Completely at Random (MCAR). In this data cleaning process, the researchers addressed these missing values through mean substitution (Allison, 2009). Thereafter, the necessary statistical analyses were conducted. For all the tests performed, a significance level of .05 was used.

3.6.1 Descriptive Statistics

The analysis of the descriptive statistics provided insights into the sample's demographic characteristics, which was used to explore how these characteristics may have influenced the relationships of the variables explored later. To assess the demographic variables of the study, frequencies and percentages were calculated. Additionally, descriptive statistics were used to comprehensively summarise the participants' responses in terms of their most to least important issues of concern, to be discussed in the results section to answer research question 3. Normality, a crucial aspect of parametric assumptions, was also assessed through the use of descriptive statistics which included skewness and kurtosis coefficients, normality plots through histograms, outliers, means, and standard deviations. For additional normality assessment, the Shapiro-Wilk test and Kolmogorov-Smirnov test were run.

3.6.2 Confirmatory and Exploratory Factor Analysis

Confirmatory factor analysis (CFA) is a structural equation modelling technique used to assess the relationship between the observed variables and latent factors, either by assessing an already existing EFA structure or by assessing existing theory and scales of measure to assess cross-cultural validity (Brown & Moore, 2012; Suhr, 2006). The CFA was run to ensure that the scale

items accurately reflected and measured the underlying latent constructs of the ESE-20 and the EAQ-22. As SPSS does not have the functional capabilities of conducting a CFA, an extension programme called SPSS Analysis of Moment Structure (AMOS) version 29 was utilised. SPSS AMOS allowed the researcher to make use of the graphical interface to draw the path diagrams for EAQ-22 and ESE-20 to visually represent the factor structures proposed by prior research. Prior to conducting a CFA, numerous assumptions had to be met. These include a sample size of a minimum of 200 or more participants for reliable estimates to be achieved, however, a sample of 100-200 participants can yield reliable responses but must be interpreted with more caution (Kyriazos, 2018). Additionally, the data needed to have multivariate normality, no outliers, and linearity (Osborne & Overbay, 2004).

The most important step before CFA could take place, was the availability of previous research specifying the latent variables to define the CFA model. In assessing model fit, Gupta and Singh (2015) describe the absolute fit and incremental fit measures. The absolute fit measures include the goodness of fit (GFI) measure which is how well the model fits the data; and the badness of fit, which measures the lack of fit, and includes measures such as Chi-square statistic divided by degrees of freedom (CMIN/DF), the Standardised Root Mean square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). The measures of incremental fit, known as the baseline comparisons, are measured through the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI) (Gupta & Singh, 2015). A summary of the ideal thresholds for these are presented in Table 3.2 (Gupta & Singh, 2015).

Table 3.2: Ideal thresholds for fit indices

Fit Index	Ideal Threshold		
	Perfect Fit	Good Fit	Moderate Fit
CFI (Comparative Fit Index)	≥ 0.95	Between 0.90 and 0.95	Between 0.80 and 0.90
TLI (Tucker-Lewis Index)	≥ 0.95	Between 0.90 and 0.95	Between 0.80 and 0.90
GFI (Goodness-of-Fit Index)	≥ 0.95	Between 0.90 and 0.95	Between 0.80 and 0.90
RMSEA (Root Mean Square Error of Approximation)	≤ 0.05	Between 0.05 and 0.08	Between 0.08 and 0.10
SRMR (Standardised Root Mean square Residual)	< 0.09	-	-
P-Close	> 0.05	-	-
CMIN/DF (Chi-square/degrees of freedom)	Between 0 and 1	Between 1 and 3	Between 3 and 5

Exploratory factor analysis (EFA) is a reduction technique that helps identify the number of constructs and the underlying factor structure, to assess how many factors are present and which items load on these respective factors (Suhr, 2006). The assumptions that need to be met for EFA include the absence of multicollinearity, adequate sample size, normality, and the absence of outliers, linearity, and factorisability (Yong & Pearce, 2013). The methods of extraction for EFA include maximum likelihood, principal components analysis, principal axis factoring, unweighted least squares and image factoring (Taherdoost et al., 2014). The choice for extraction is discussed in the results section. The criteria for retaining factors are based on the scree plot and retaining factors with eigenvalues greater than 1 (Yong & Pearce, 2013). The EFA helped determine what factor structure emerged from the data. Prior to conducting an EFA, numerous assumptions had to be met. These include a sample size of a minimum of 200 or more participants for reliable estimates to be achieved (Kyriazos, 2018), however, a sample of 100-200 participants can yield reliable responses but must be interpreted with more caution (Kyriazos, 2018). Additionally, the data needs to have normality, linearity, and no multicollinearity (Field, 2013). As the EFA is sensitive to outliers, this must also be checked.

The following hypotheses can be made about the scales of measure used for this study:

1. For the EAQ-22:

H₀: The original EAQ-22 will be structurally valid and reliable for use in the South African context, as it will have good model fit

H₁: The original EAQ-22 will be structurally valid and reliable for use in the South African context, as it will not have good model fit and thus an EFA will need to be conducted

2. For the ESE-20

H₀: The original ESE-20 will be structurally valid and reliable for use in the South African context, as it will have good model fit

H₁: The original ESE-20 will be structurally valid and reliable for use in the South African context, as it will not have good model fit and thus an EFA will need to be conducted

3.6.3 Pearson's Correlation

A Pearson's correlation "measures the strength of linear association between two [normally distributed] variables" (Sedgwick, 2012 p. 1). In this study, it measured the relationship strength and direction of eco-anxiety and environmental self-efficacy. If the data is non-normally distributed, Spearman's correlation analysis can be conducted. The outcome value, Pearson's correlation coefficient (r), is measured as a value ranging between -1 and +1. Table 3.3 provides the correlation interpretations and ranges (Akoglu, 2018).

Table 3.3: Interpretation of Pearson or Spearman correlations

Correlation Range	Correlation Interpretation
± 1	Perfect
$\pm .70 - .90$	Strong
$\pm .40 - .60$	Moderate
$\pm .10 - .30$	Weak
0	None

As mentioned, the emotional responses to ecological changes can either help in decreasing one's eco-anxiety or it can exacerbate the eco-anxiety one feels. Therefore, the following hypothesis can be drawn for the Pearson's correlation:

1. A significant negative relationship exists between environmental self-efficacy and eco-anxiety, meaning that those with higher environmental self-efficacy will have lower eco-anxiety and vice versa.

3.6.4 Independent samples t-test

An independent samples t-test is an inferential statistical test that aims to assess the means of two unrelated groups (Ross & Willson, 2017). For the purposes of the current study, an independent samples t-test was conducted to make comparisons of the mean differences between gender, age and geographic location for eco-anxiety, and environmental self-efficacy. The assumptions included the data being at least interval, homogeneity of variances, independent observations, and normality. The effect size, Cohen's d , provided the size difference between the means (Ross & Willson, 2017) to understand whether gender, age or geographic location played a significant role in eco-anxiety and environmental self-efficacy in

real-world contexts. The following hypotheses can be made for the independent samples t-tests that will be conducted:

H₀: There will be significant differences in eco-anxiety and environmental self-efficacy scores between male and female participants; between those younger than 25 and older than 25; and between those from urban and rural areas

H₁: There will be no significant differences in eco-anxiety and environmental self-efficacy scores between male and female participants; between those younger than 25 and older than 25; and between those from urban and rural areas

3.7 Conclusion

In conclusion, this chapter has outlined the comprehensive research methodology employed in this study, which entailed a discussion of the research design, the sampling procedures, the instruments utilised, the ethical considerations, and the data analysis techniques. By adopting a positivist, quantitative, and non-experimental approach, the researcher could structurally and systematically explore the relationship between eco-anxiety and environmental self-efficacy among a sample of 218 young adults.

The sample was ethically accessed through convenience and purposive sampling. This was also supplemented by forms of digital distribution, through means of a research flyer, to ensure sufficient participant reach. Data was collected via REDCap, which collected responses anonymously, and ensured confidentiality and participant data protection through its efficient and secure platform tools. The study used three instruments which included a demographic questionnaire, the Eco-anxiety Questionnaire (EAQ-22), and the Environmental Self-Efficacy Scale (ESE-20). The reliability and validity of these tools have been outlined by previous research, however, their reliability and validity within the South African context will be presented in the following chapter, with the results of all the aforementioned analyses.

CHAPTER 4: RESULTS

4.1 Introduction

In the following chapter, the results of the statistically analysed data are presented. Firstly, the descriptive statistics section includes the tables and explanations for the demographic information regarding the participants' primary concerns. This is followed by the confirmatory and exploratory factor analyses. Thereafter, the results of the Pearson's correlation and the independent samples t-test are presented.

4.2 Descriptive Statistics

The descriptive statistics, which include frequencies and percentages, for the demographic variables of age, gender, race, employment status, area of residence, highest education level, and type of high school attended, are found in section 3.3 of the Methods Chapter.

Table 4.2.1 provides the results of the 10 concerns that were ranked by the sample group, with a rating of 1 (the most important concern) to 10 (the least important concern). The concerns evaluated included a wide range of issues from personal concerns to global concerns. Although some of the responses contain missing values for this section of the demographic questionnaire, this was not the primary focus of the study. The objective of this was to determine where environmental issues were placed as a concern for students.

As outlined in Table 4.2.1, the top three most important concerns for South African students, only taking into account responses to the most important issues (that is responses to rating 1) were: 'personal issues' ($n = 64$), religious concerns ($n = 32$), and personal safety issues ($N = 23$). Furthermore, using the overall primary concerns as the responses for ratings 1 to 3 (that is combining the number of responses for ratings 1, 2 and 3), the top three primary concerns were: 'personal issues' ($n = 101$), 'economic concerns' ($n = 68$), and 'personal safety' ($n = 65$). On the other end of the spectrum, looking at the student's three issues of absolute least concern, that is looking at responses only with the rating 10, 'technological concerns' ($n = 47$), 'international tensions' ($n = 38$), and 'religious concerns' ($n = 27$) were what some students were least concerned about. Using the overall bottom three concerns as the responses to ratings 8 to 10 (that is combining the number of responses for ratings 8, 9 and 10), the participants are least concerned with 'technological concerns' ($n = 88$), 'international tensions' ($n = 82$), and 'political issues' ($n = 61$).

Taking the core focus of the study into account, which is eco-anxiety and environmental self-efficacy, Table 4.2.1 highlights that environmental concerns were not a primary concern for most students, as only six ($n = 6$) respondents ranked environmental concerns as their most important concern. Using the sum of the values of the top three and bottom three responses, a larger number of participants are not as concerned ($n = 57$) about environmental issues compared to those who are ($n = 42$). The results provided valuable insights into the broader psychosocial context in which environmental concerns are situated.

Table 4.2.1: Descriptive data for issues of importance

Item	Rating Frequencies									
	1	2	3	4	5	6	7	8	9	10
International tensions (e.g. War)	11	10	7	10	13	12	22	24	20	38
Social concerns (e.g. Poverty, gender-based violence, and inequity)	14	12	17	25	22	15	13	20	8	4
Environmental concerns (e.g. Global warming, ecological disasters)	6	21	15	14	19	17	18	21	27	9
Personal issues (e.g. Academics, identity, family)	64	24	13	9	8	8	6	8	17	16
Economic concerns (e.g. Post-graduate employment, cost of living)	10	25	31	12	20	19	11	10	9	10
Health concerns (e.g. Cancer, HIV/AIDS, COVID-19)	5	20	25	28	24	30	18	11	4	3
Religious concerns (e.g. Prayer, sinning, inter-faith conflicts)	32	13	17	16	15	12	18	16	15	27
Political concerns (e.g. Xenophobia, load-shedding, corruption)	2	12	9	25	20	21	30	31	23	7
Personal safety issues (e.g. crime, violence, cyberbullying)	23	19	23	21	18	25	13	13	23	9
Technological Concerns	14	10	22	14	19	23	17	23	18	47

4.3 Confirmatory Factor Analysis for the EAQ-22 and ESE-20 scales

For a CFA, there needs to be a large enough sample, ideally greater than 300 respondents for ‘good or excellent’ results (Kyriazos, 2018). However, a sample of 200 or more is sufficient to produce ‘fair’ results (Kyriazos, 2018). In the case of the current study, the sample was

sufficient ($N = 218$) for conducting a CFA, however, results needed to be interpreted with caution.

4.3.1 Normality of the EAQ-22 and ESE-20 scales

Prior to conducting the CFA, the assumption of normal distribution had to be tested, as this is one of the key assumptions that must be met for all data analysis techniques. Firstly, the data had to be interval, which in this case it was. The second assumption that had to be checked was the normality of the data, with no outliers being present. Tables 4.3.1 and 4.3.2 present the descriptive statistics for the EAQ-22 and ESE-20 scales.

Table 4.3.1: Descriptive statistics for the EAQ-22 and ESE-20

Scale	N	Skewness	Kurtosis
EAQ-22	218	-0.32	0.16
ESE-20	218	-0.34	-0.20

Table 4.3.2: Normality for the EAQ-22 and ESE-20

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EAQ-22	0.06	218	.06	0.99	218	.09
ESE-20	0.06	218	.09	0.99	218	.02

From the tables above, it can be observed that an approximate normal distribution was assumed as a result of the sample size. The Central Limit Theorem (CLT) states that for a sample size greater than or equal to thirty ($N \geq 30$), the distribution will be approximately normal. The histograms provided a detailed representation of the spread of the data (Figures 4 and 5, Appendix J), which was observed by the bell-shaped curve that data was normally distributed. The skewness coefficient for the EAQ-22 was -0.32 and for the ESE-20 was -0.34, which are both between the accepted values range of -1 to 1. The other measure of normality is that of kurtosis, which is required to be within the range of -3 and +3 (Field, 2013). The kurtosis coefficient for the EAQ-22 was 0.16 and for the ESE-20 it was -0.20, both within the acceptable range. The third measure of normality is Kolmogorov-Smirnov and Shapiro-Wilk, where non-significant results are an indication of normality. For the EAQ-22 ($p = .06$) and ESE-20 ($p = .09$), both p-values of the Kolmogorov-Smirnov test were greater than the level of significance

of .05, which indicated non-significance, thus normal distribution was achieved. The Shapiro-Wilk value for the EAQ-22 scale indicates non-significance ($p = .09$, $p > .05$) which is an indication of normal distribution. However, the significance of the ESE-20 scale ($p = .02$, $p < .05$) is an indication of non-normal distribution. As all other results for measures of sample size, skewness, kurtosis and Kolmogorov-Smirnov indicate normal distribution, approximate normality was assumed.

Once univariate normality is assumed, multivariate normality can be assessed using Mahalanobis distance, Cook's distance, leverage values, and standardised residual scores were assessed (Leys et al., 2018). The Mahalanobis distance (critical value = 13.82) identifies multivariate outliers in the data, found no outliers present as no values were above the critical value. Cook's distance, which must be less than 1, indicated that there were no influential points as all the Cook's distance values were below 1. The standardised residual scores, which assess univariate outliers that have a value greater than 3 and -3, indicated that no values fell beyond this range. The leverage value is calculated using the formula $\frac{k+1}{n} \times 3$ where k is the number of IVs and n is the sample size. This was calculated and provided a cut-off of 0.041, and it is indicated that 1 participant was above this cut-off with a value of 0.042. However, this participant was only 0.001 above the cut-off, therefore the researcher decided to keep them in the dataset for analysis, as Gibbert et al. (2021) outline that outliers can prove valuable for theory-building, which the current study aims to contribute to in the limited research on the topic of eco-anxiety and environmental self-efficacy.

The linearity of the relationship between the independent (ESE-20) and dependent (EAQ-22) variables was another assumption that was assessed. This was assessed through the scatterplot function on SPSS, by placing the EAQ-22 scale on the y-axis and the ESE-20 scale on the x-axis. The graphical representation (Figure 6, Appendix J) provides a visual representation of the relationship, with the line of best fit indicating that linearity was present.

4.3.2 CFA for the EAQ-22

All the assumptions outlined in Section 3.6.2 were met and the CFA was conducted. A CFA utilising SPSS AMOS Version 29 and maximum likelihood estimation, was conducted to assess the model fit of the factors influencing Eco-anxiety. Previous researchers (Ágoston et al., 2022) have hypothesised that eco-anxiety is influenced by two latent factors, namely Habitual Worry (HB) and Negative Consequences of eco-anxiety (NC), as presented in Figure 1.

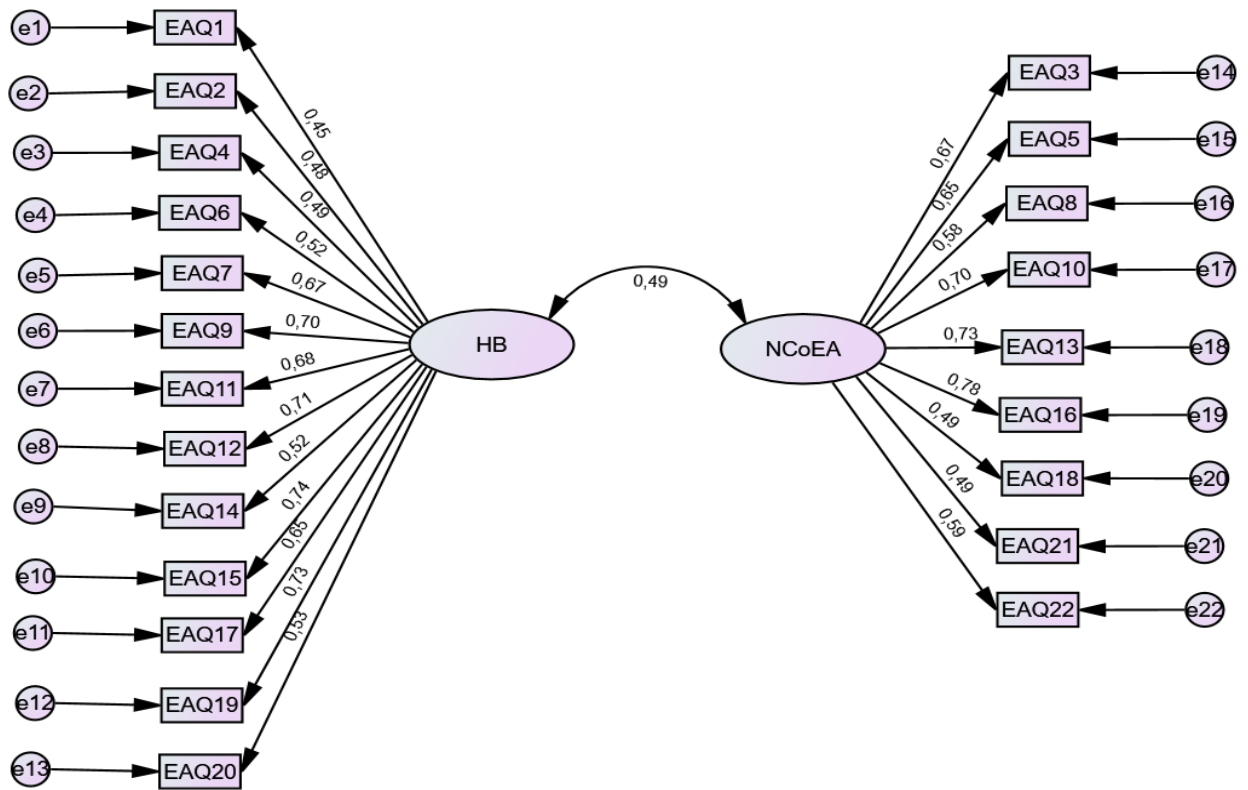


Figure 1: Two-factor structure of the EAQ-22

Table 4.3.3: Comparative fit indices for EAQ-22 models

	GFI	CFI	TLI	SRMR	RMSEA	P-Close	CMIN/DF
EAQ 22 items	0.88	0.92	0.91	0.06	0.05	0.26	1.63
Ideal threshold	0.90	0.90	0.90	<0.09	<0.08	>0.05	<3.0

For a model to show significance, it should have a p-value greater than the level of significance (.05), that is, a non-significant result. The EAQ-22 model yielded a chi-squared result that showed significance $\chi^2(208) = 339.64$, $p < .001$, which indicates that the model was not a good fit. Schermelleh-Engel et al. (2003) explain that the chi-square and its p-value alone cannot determine good fit, and that this interpretation should be balanced with other fit indices. The Chi-square and p-value are influenced by the size of the sample, and thus a better means of assessing model fit would be to compare CMIN/DF (Kline, 2005), that is the χ^2 with the number of degrees of freedom (Schermelleh-Engel et al., 2003). As presented in Table 4.3.3 above, the CMIN/DF produced was 1.63, which according to Gupta and Singh (2015), and Hu and Bentler (1999) is considered acceptable as it is below 3, indicating a good model fit. Furthermore, previous validation of this scale by Zeier and Wassa (2024), for their German sample, and by

Micoulaud-Franchi et al. (2024), for their French sample, accepted the model fit of their CFA and EFA for the EAQ-22 with $p < .001$. Therefore, the decision was made to accept the model fit based on the aforementioned reasons, however, further model fit assessment was conducted.

To understand the model fit a bit better, incremental fit indices were assessed. These all yielded values that indicated a good model fit for the two-factor structure of the EAQ-22. Using the ideal thresholds of Gupta and Singh (2015) in Table 3.2 in Section 3.6.2, it was observed that all incremental fit statistics were above the threshold of 0.90 which indicated good fit. Looking at the results in Table 4.3.3, the CFI was 0.92, and the TLI was 0.91, which showed good fit. Gupta and Singh (2015) state that the ideal threshold for good fit is 0.90 and above. However, the GFI value yielded was 0.88, which is satisfactory for the ‘acceptable fit’ threshold of 0.80 - 0.90 (Gupta & Singh, 2015). The RMSEA produced a value of 0.05, which was below the ideal threshold of 0.08, another indication of good fit. Lastly, the SRMR must be below 0.90, which, for the EAQ-22 was 0.06. The indices produced are an indication of good fit of the two-factor model for the EAQ-22 scale in the South African context.

Table 4.3.4: CFA of the EAQ-22 Standardised Factor Loadings

Item No.	CFA	
	Factor 1	Factor 2
EAQ 1	0.45	
EAQ 2	0.48	
EAQ 3		0.67
EAQ 4	0.49	
EAQ 5		0.65
EAQ 6	0.52	
EAQ 7	0.67	
EAQ 8		0.58
EAQ 9	0.70	
EAQ 10		0.70
EAQ 11	0.68	
EAQ 12	0.71	
EAQ 13		0.73
EAQ 14	0.52	
EAQ 15	0.74	
EAQ 16		0.78
EAQ 17	0.65	
EAQ 18		0.49
EAQ 19	0.73	
EAQ 20	0.53	
EAQ 21		0.49
EAQ 22		0.59

As model fit only provides a basic understanding of the scale for the South African context, Cheung et al. (2024) suggest assessing convergent validity through the standardised factor loadings greater than 0.4, as well as assessing the average variance extracted (AVE). Table 4.3.4 presents the standardised factor loadings for the EAQ-22; however, these loadings can also be seen in Figure 1 above. As observed, all factor loadings are greater than 0.4, with the statistically significant factor loadings ranging from 0.45 to 0.78, supporting convergent validity of the EAQ-22. Additionally, the AVE is calculated using the formula of:

$$AVE = \frac{\sum(\text{standardised factor loadings}^2)}{n},$$

where n is the number of indicators of the construct (Cheung et al., 2024). Using the standardised factor loadings from Table 4.3.4, the AVE was calculated as 0.39. This is below the recommended value of 0.50 for supporting convergent validity (Cheung et al., 2024). Furthermore, construct reliability assesses how reliable the instrument is, and is calculated using the formula:

$$CR = \frac{\sum(\text{standardised factor loadings})^2}{\sum(\text{standardised factor loading})^2 + \sum(e_i)},$$

where e_i refers to the error variances (Table 4.3.5). The CR was calculated as 0.95. This value has to be greater than 0.5 (Cheung et al., 2024). Although the AVE is below 0.50, Fornell and Larcker (1981) explained that if the AVE is less than 0.5, but the construct reliability is greater than 0.6, then convergent validity is still supported. As the findings have indicated, the CR is greater than 0.6, therefore convergent validity for the EAQ-22 is supported.

Table 4.3.5: Calculations for AVE and CR

Construct	$\sum(\text{stand. factor loadings})$	$\sum(\text{stand. factor loadings}^2)$	$\sum(e_i)$
Factor 1 (HW)	7.87	4.90	5.32
Factor 2 (NC)	5.67	3.65	3.74
EAQ-22 Scale	13.54	8.55	9.06

4.3.3 CFA for the ESE-20

The ESE-20 is a comprehensive scale that addresses aspects such as character strengths toward environmental self-efficacy, pro-environmental behaviours, and the psychological barriers associated with environmental self-efficacy (Moeller & Stahlmann, 2019). Moeller and Stahlmann (2019) indicated the presence of unidimensionality based on Eigenvalues greater than 1, with their first five eigenvalues being **9.67**, 0.76, 0.47, 0.33 and 0.18. This indicated that all 20 items loaded onto a single factor, with the Eigenvalue of 9.67. Figure 2 shows the factor structure of the ESE-20.

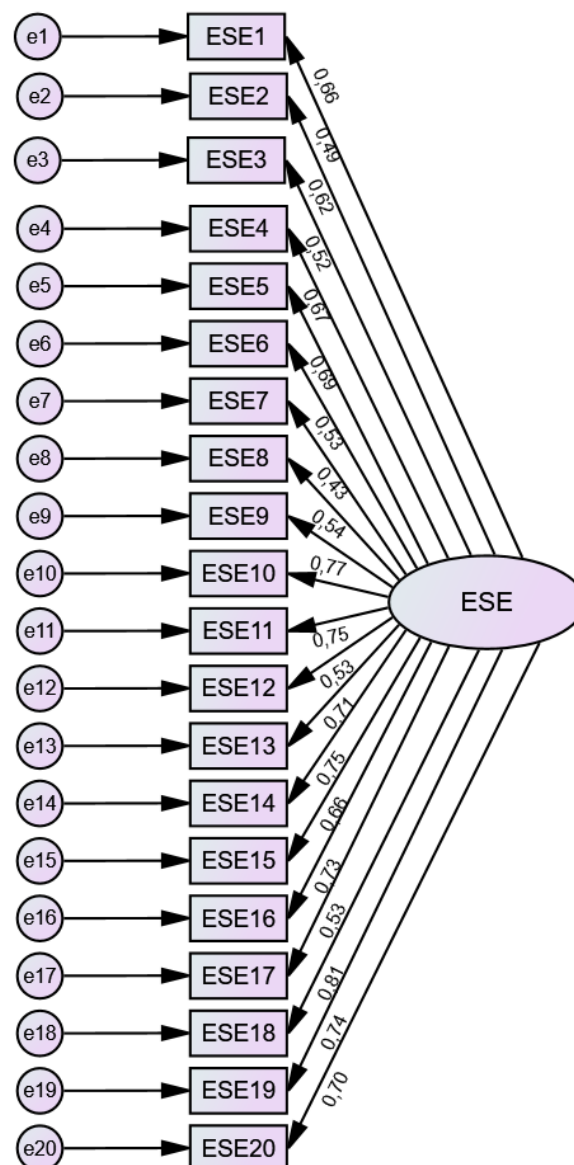


Figure 2: One factor structure of ESE-20

Table 4.3.6: CFA standardised factor loadings of ESE-20

Item No.	CFA
	Factor 1
ESE1	0.66
ESE2	0.49
ESE3	0.62
ESE4	0.52
ESE5	0.67
ESE6	0.69
ESE7	0.53
ESE8	0.43
ESE9	0.54
ESE10	0.77
ESE11	0.75
ESE12	0.53
ESE13	0.71
ESE14	0.75
ESE15	0.66
ESE16	0.74
ESE17	0.53
ESE18	0.81
ESE19	0.74
ESE20	0.70

Table 4.3.7: Model summary of incremental fit indices for the ESE-20

	GFI	CFI	TLI	SRMR	RMSEA	PCLOSE	CMIN/DF
ESE 20 items (1 factor model)	0.73	0.80	0.77	0.08	0.11	0.00	3.80
Ideal threshold	0.90	0.90	0.90	<0.09	<0.08	>0.05	<3.0

A CFA, utilising SPSS AMOS Version 29 and maximum likelihood estimation, was conducted to assess the model fit for the factors influencing Environmental Self-efficacy. Previous researchers had hypothesised that environmental self-efficacy was influenced by one latent factor, making the ESE-20 a unidimensional scale. Figure 2 shows the one-factor structure of the ESE-20. The chi-squared result showed significance $\chi^2 (170) = 645.15$, $p < .001$, which indicates that the model was not a good fit. The incremental fit statistics (Table 4.3.7) values [GFI = 0.73, CFI = 0.80 and TLI = 0.77] all yielded results that were below 0.90, further indicating a lack of model fit. The CMIN/DF ratio was 3.80, which was above the ideal threshold of 3. The SRMR needs to be 0.09 or less (Gupta & Singh, 2015). The SRMR produced a value of 0.08, which is acceptable. The RMSEA was 0.11, which is greater than the ideal threshold of 0.08. This all further indicated that the model was not a good fit. Therefore, an EFA was conducted to determine what the underlying factor structure was.

4.4 EFA of the ESE-20

The ESE-20 CFA proved that the model was not a good fit and therefore an EFA was conducted. Burton and Mazerolle (2011) highlight that using Principal Axis Factoring is a common method of extraction in EFA, especially when the aim is to determine latent constructs. The Promax oblique rotation was utilised as it takes into account that the factors and constructs are correlated (Taherdoost et al., 2014). The researcher conducted an EFA using the extraction method based on the number of factors, for a one-factor, two-factor, three-factor, and four-factor structure. Since SPSS cannot perform extraction based on one factor, this was removed as a possible factor structure. After performing the EFA for the two-, three-, and four-factor structures; it was concluded that the two-factor solution produced the best structure as all items loaded on at least one of the two factors. The three- and four-factor structures had two items loading onto the third and fourth factors, which is not ideal for a factor to maintain construct validity (El-Den et al., 2020). Furthermore, for research in the humanities field, one needs the factor extraction should be stopped and explained by at least 50-60% (Taherdoost et al., 2014), which in this case was at two factors. This was all confirmed with assistance of the WITS Stats Central statistician.

The correlation matrix (Table 4.4A, Appendix K), which is important for understanding that there is no multicollinearity, indicated that there were no high correlations. The Kaiser-Meyer-Olkin (KMO) in Table 4.4.1 indicated meritorious suitability with a value of 0.93. Bartlett's Test of Sphericity, also presented in Table 4.4.1, was significant, $\chi^2 (190) = 2446.03$, $p < .001$.

Table 4.4.1: KMO and Bartlett's for ESE-20

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity		
	Approx. Chi-Square	df	Sig.
0.93	2446.03	190	<.001

The factor analysis revealed that a two-factor structure was extracted. The Eigenvalues indicated that the two factors extracted produced eigenvalues of 9.04 and 1.77, accounting for 54.05% of the total variance (as seen in Table 4.4.2). The first factor explained 45.20% of the variance, while the second factor explained 8.85% of the variance. The scree plot (Figure 3, Appendix K) also indicated that there were two factors extracted, as observed with the two points above the inflection point.

Table 4.4.2: Total Variance explained.

Factor	Eigenvalues	% of variance	Cumulative % variance
1	9.04	45.20	45.20
2	1.77	8.85	54.05

The items loaded moderately to strongly onto their respective factors, with factor loadings ranging from 0.35 to 0.74, confirming that the items were appropriately aligned with the underlying constructs of environmental self-efficacy, as presented in Table 4.4.3.

Table 4.4.3: Factor loadings for ESE

ESE Item	Factor 1	Factor 2	Communalities
	Pattern Matrix	Pattern Matrix	
ESE1		0.41	0.48
ESE2		0.93	0.65
ESE3		0.63	0.53
ESE4		0.93	0.67
ESE5		0.70	0.62
ESE6	0.62		0.52
ESE7	0.55		0.34
ESE8		0.52	0.30
ESE9		0.62	0.44
ESE10	0.74		0.63
ESE11	0.43		0.60
ESE12		0.43	0.35
ESE13	0.53		0.53
ESE14	0.85		0.66
ESE15	0.68		0.49
ESE16	0.99		0.74
ESE17	0.67		0.38
ESE18	0.84		0.72
ESE19	0.84		0.65
ESE20	0.49		0.52

Table 4.4.3 represents the factor loadings of the final two-factor structure of the ESE scale, a better suited structure in the South African context. Factor 11 initially had a cross-loading on both factor 1 (0.43) and 2 (0.41), however, as it loaded slightly higher on factor 1 the decision

was made for it to be extracted with factor 1. The first factor extracted was made up of items 6, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, and 20. The second extracted factor was made up of items 1, 2, 3, 4, 5, 8, 9, and 12. It can be observed that for Factor 1, a common theme that emerges is personal responsibility for making “environmentally friendly choices” and proactive agency one has to influence others positively. Words such as “financial burden”, “environmentally friendly consumer”, “eating choices”, and “learn about new issues” for example, all require individual effort that requires personal awareness and responsibility. Therefore, the subscale was given the name ‘Personal environmental agency’ subscale. For Factor 2, the common theme that emerged was the idea of community involvement and collective action for making meaningful change, with words such as “community”, “activism”, “part of the solution”, and “next generation”; thus, the subscale was named ‘Collective environmental agency’.

4.5 Internal Consistency reliability of the scales

The reliability of the EAQ-22 and the ESE-20 needed to be assessed before any tests could be conducted on the data. The reliability of a scale indicates whether a psychological measuring instrument is able to replicate its results when administered under different conditions, established through Cronbach’s Alpha (Heale & Twycross, 2015; Souza et al., 2017). This should be a value between 0 and 1 and measures a scale’s internal consistency. In Table 4.5.1, the interpretation for Cronbach’s alpha coefficients is provided. In Table 4.5.2, the respective Cronbach’s Alpha coefficients are presented for each scale.

Table 4.5.1: Interpretation of Cronbach’s Alpha (Field, 2013)

Alpha value	Interpretation
.80 – .95	Excellent
.70 – .79	Very Good
.60 – .69	Satisfactory
< .60	Suspect

Table 4.5.2 displays the Cronbach’s Alpha coefficients for the EAQ-22 scale. The overall EAQ-22 scale showed excellent reliability ($\alpha = .90$). This highlights that all 22 items demonstrated high internal consistency indicating that the items are consistent with one another to measure the construct of eco-anxiety (EA). Furthermore, Table 4.5.2 presents the Cronbach’s Alpha coefficients for the two EAQ-22 subscales. The Habitual Worry ($\alpha = .89$) and the

Negative Consequences of Eco-anxiety ($\alpha = .85$) subscales both demonstrated excellent reliability.

Table 4.5.2: Reliability for EAQ factor scales

Scale	No. of items	Cronbach's Alpha
Habitual worry (Factor 1)	13	.89
Negative consequences of eco-anxiety (Factor 2)	9	.85
Total EAQ-22	22	.90

Taking a look at each item and how it would affect the internal consistency of the EAQ-22 scale as a whole (Table 4.5.2A, Appendix K), it was observed that none of the items would drastically affect the overall Cronbach's alphas if they were to be removed. In fact, if any item were to be removed it would either bring the internal consistency down slightly or it would remain the exact same. Therefore, all 22 items remained in the scale as they all contributed well to the overall internal consistency.

A summary of the reliability analysis for the ESE-20 scale is presented in Table 4.5.3. The overall ESE-20 scale, demonstrated excellent reliability ($\alpha = .93$), indicating high internal consistency for the ESE items. Furthermore, the Personal Environmental Agency (PEA) subscale (factor 1) showed excellent reliability ($\alpha = .92$). The Collective Environmental Agency (factor 2) also demonstrated excellent reliability ($\alpha = .84$). Therefore, with excellent reliability for both the overall ESE-20 scale and the two subscales, the ESE-20 scale was proven reliable in the South African context.

Table 4.5.3: Reliability for ESE factor scales

Scale	No. of items	Cronbach's Alpha
Personal environmental agency (Factor 1)	12	.92
Collective environmental agency (Factor 2)	8	.84
Total ESE-18 Scale	20	.93

Taking a look at each item and how it would affect the internal consistency of the ESE-20 scale (Table 4.5.3A, Appendix K), it was observed that none of the items would drastically affect the overall Cronbach's alphas if they were to be removed. Therefore, all 20 items remained in the scale.

4.6 Descriptive Statistics after final scales

As the CFA and EFA were conducted, with the new scale of environmental self-efficacy variable, the descriptive statistics were analysed to assess the levels of eco-anxiety and environmental self-efficacy among young adults in South Africa. Table 4.6.1 provides a summary of these descriptive statistics, including the minimum and maximum scores, means, standard deviations, skewness, and kurtosis for both eco-anxiety (EAQ-22) and environmental self-efficacy (ESE-20), as well as their respective subscales.

Table 4.6.1: Descriptive statistics for the EAQ22 and ESE20

Scale	N	Min	Max	Mean	SD	Skewness	Kurtosis
EAQ-22	218	22	80	54.68	10.20	-0.32	0.16
HW	218	16	51	39.83	7.14	-0.91	0.75
NC	218	9	30	14.84	4.75	0.91	0.31
ESE-20	218	19	196	125.06	34.95	-0.34	-0.20
PEA	218	14	120	82.15	22.56	-0.56	-0.06
CEA	218	5	78	42.91	15.16	0.04	-0.68

Note: EA= Eco-Anxiety, ESE= Environmental Self-efficacy, HW= Habitual Worry, NC= Negative Consequences of Eco-Anxiety, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

The EAQ-22 scores had a minimum score of 22 and a maximum score of 80 ($M = 54.68$, $SD = 10.20$). With scores ranging from 22 to 80, the mean score is situated approximately in the middle of this range ($M = 54.68$). This indicated that young adults experience moderate levels of eco-anxiety. Additionally, the standard deviation ($SD = 10.20$) indicated most responses were close to the mean score. Kurtosis (0.16) was within the range of -3 and +3. In terms of the skewness (-0.32), the slightly negative skew suggests that there are participants who scored lower than the mean, which pulled the distribution to the left (Figure 4, Appendix J). However, this skewness coefficient is within the range of -1 and +1, accounting for normal distribution.

The Habitual Worry (HW) subscale of the EAQ-22 yielded a mean score of 39.81 ($SD = 7.14$). With a minimum score of 16 and a maximum score of 51, this mean score indicates that participants responded with moderate to high levels of worry. Furthermore, the HW subscale had skewness (-0.91) and kurtosis (0.75) values within the required ranges. The negative skewness coefficient suggests that more participants responded on the higher end of the scale, indicating that more are concerned about the ecological crisis. The Negative Consequences of Eco-anxiety subscale (NC) had scores ranging from 9 to 30 ($M = 14.84$, $SD = 4.75$). This

indicates that participants responded with lower scores for the NC subscale. The skewness (0.91) and kurtosis (0.31) were within the required ranges. The positive skewness value indicates that participants reported minimal experience of the negative consequences of eco-anxiety as the responses were mostly concentrated around the minimal score.

For Environmental Self-efficacy, the ESE-20 had a minimum score of 19 and a maximum score of 196 ($M = 125.06$, $SD = 34.95$). The mean score is closer to the maximum, suggesting that young adults had higher environmental self-efficacy. The standard deviation is quite large, which shows that there was more variability in how young adults perceived their ability to make change. Kurtosis (-0.20) was within the required range of -3 and +3. The skewness coefficient of -0.34 highlights a slight negative skew, which pulled the distribution tail slightly to the left (Figure 5, Appendix J). This indicated that more participants scored higher than the mean, with a few responses scoring below it.

The Personal Environmental Agency (PEA) subscale of the ESE-20 had a score range of 14 to 120 ($M = 82.15$, $SD = 22.56$). The mean score is towards the higher end of this range, indicating that participants feel confident in their personal ability to take action. Furthermore, the PEA subscale had skewness (-0.56) and kurtosis (-0.06) values within the required ranges. The negative skewness coefficient suggests that more participants responded on the higher end of the subscale, meaning their personal environmental self-efficacy is rather high. The Collective Environmental Agency (CEA) subscale of the ESE-20 had a minimum score of 5 and a maximum score of 78 ($M = 42.91$, $SD = 15.16$). This indicates that participants responded moderately to collective agency. The skewness (0.04) and kurtosis (-0.68) were within the required ranges. The positive skewness value indicates that data responses accumulated more on the lower end of the subscale, meaning that more participants did report a stronger sense of environmental self-efficacy in collective situations. Having established the reliability of the scales, the researcher examined the relationship between eco-anxiety and environmental self-efficacy by conducting a Pearson's moment correlation.

4.7 Pearson's Correlation

A Pearson's correlation was conducted to establish whether the hypothesised relationship between eco-anxiety and environmental self-efficacy existed, and to determine the extent and nature of this relationship. The hypothesised relationship was that there would be a negative

relationship between EA and ESE. However, before the correlation could be conducted, the assumptions were checked and met.

Table 4.7.1: Pearson's Correlation between Eco-anxiety and Environmental Self-efficacy

Variable		EA	ESE	HW	NC	PEA	CEA
1. EA	Pearson Correlation	-	.07	.91**	.78**	.06	.06
	Sig. (2-tailed)		.34	<.001	<.001	.35	.42
2. ESE	Pearson Correlation	.07	-	.08	.02	.91**	.89**
	Sig. (2-tailed)	.34		.25	.75	<.001	<.001
3. HW	Pearson Correlation	.91**	.08	-	.45**	.10	.04
	Sig. (2-tailed)	<.001	.25		<.001	.15	.60
4. NC	Pearson Correlation	.78**	.02	.45**	-	-.01	.06
	Sig. (2-tailed)	<.001	.75	<.001		.88	.35

Note: EA= Eco-Anxiety, ESE= Environmental Self-efficacy, HW= Habitual Worry, NC= Negative Consequences of Eco-Anxiety, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency.

**Significance at the 0.001 level

The Pearson product-moment correlation was conducted to assess the relationship between eco-anxiety (EA) and environmental self-efficacy (ESE). The analysis revealed a statistically non-significant, very weak positive correlation between EA and ESE ($r = .07$, $p = .34$). This result suggests that no relationship exists between eco-anxiety and environmental self-efficacy. Looking at Table 4.7.1, the only significant relationships found were between the overall constructs EA and ESE, with their respective subscales. For EA and HW ($r = .91$, $p < .001$) and EA and the NC subscale ($r = .78$, $p < .001$) were significant, however this is expected as it is for the same construct. Similarly, overall ESE was significant with both the PEA ($r = .91$, $p < .001$) and CEA subscales ($r = .89$, $p < .01$).

The ESE and EAQ subscales also showed no significant correlations with one another. HW and PEA ($r = .10$, $p < .15$), and HW and CEA ($r = .04$, $p < .60$) showed non-significance in their relationships. NC and PEA ($r = -.01$, $p < .88$), and NC and CEA ($r = .06$, $p < .35$) also presented with non-significant relationships.

4.8 Independent Samples T-test

For the independent samples t-tests, the assumptions of normal distribution, that the data within the sample is independent, and homogeneity of variances were checked. The first two assumptions were met for all t-tests. Whether homogeneity of variances was met or not, is outlined in the results to follow. Homogeneity of variance was assessed with the following hypothesis:

$$H_0: \sigma_1^2 - \sigma_2^2 = 0.$$

$$H_1: \sigma_1^2 - \sigma_2^2 \neq 0.$$

4.8.1 Gender and Eco-anxiety

An independent t-test was conducted to determine whether there is a significant difference between the means of male and female levels of eco-anxiety in young adults. The required assumptions were checked. In Tables 4.8.1 and 4.8.2, the results of the independent samples t-test between the variables of eco-anxiety (EA), including that of Habitual Worry (HW) and the Negative Consequences of eco-anxiety (NC) are presented.

Table 4.8.1: Descriptive Statistics for Gender

Variable	Gender	N	Mean	Std. Deviation
EA	Male	56	53.96	12.01
	Female	158	54.81	9.54
HW	Male	56	38.64	8.00
	Female	158	40.15	6.82
NC	Male	56	15.32	5.38
	Female	158	14.66	4.49

Note: EA= Eco-Anxiety, HW= Habitual Worry, NC= Negative Consequences of Eco-Anxiety

The hypotheses for the independent samples t-test between EA, HW, NC and gender:

$H_0: \mu_1 = \mu_2$ (There is no statistically significant difference between EA, HW, and NC scores between male and female participants)

$H_1: \mu_1 \neq \mu_2$ (There is a statistically significant difference between EA, HW, and NC scores between male and female participants)

For EA and gender, homogeneity of variances was violated [EA: $F= 6.87, p=.01$], which meant that the output for equal variances not assumed was reported. An independent samples t-test was run to compare EA scores between male and female participants. There was a non-

significant difference in the scores for male ($M = 53.96$, $SD = 12.01$) and female ($M = 54.81$, $SD = 9.54$) participants; $t(212) = -0.48$, $p = .63$, $d = -0.08$.

The homogeneity of variance assumption were met for HW and NC [HW: $F = 2.91$, $p = 0.09$; NC: $F = 3.77$, $p = .05$], which meant that the output for equal variances assumed was reported. For HW and gender, an independent-samples t-test was conducted to compare habitual worry scores between male and female participants. There was a non-significant difference in the scores for male ($M = 38.64$, $SD = 8.00$) and female ($M = 40.15$, $SD = 6.82$) participants; $t(212) = -1.36$, $p = .17$, $d = -0.21$. Similarly, the independent sample t-test showed that male participants ($M = 15.32$, $SD = 5.38$) reported similar scores in their negative consequences of eco-anxiety, $t(212) = 0.83$, $p = .41$, $d = 0.14$, as the female participants ($M = 14.66$, $SD = 4.49$). Therefore, we fail to reject the null hypotheses. This suggests that gender does not have an effect on overall eco-anxiety scores, habitual worry and on the negative consequences of eco-anxiety experienced by male and female participants.

Table 4.8.2: T-test for EA, HW, NC and Gender

		Levene's Test for Equality of Variance				Test for Equality of Means		Effect size
		F	Sig	t	df	Significance Two-sided p	Mean difference	Cohen's d
EA	Equal variance assumed	6.87	.01	-0.54	212	.59	-0.85	-0.08
	Equal variance not assumed			-0.48	80.93	.63	-0.85	
HW	Equal variance assumed	2.91	.09	-1.36	212	.17	-1.52	-0.21
	Equal variance not assumed			-1.27	85.02	.21	-1.52	
NC	Equal variance assumed	3.77	.05	0.90	212	.37	0.66	0.14
	Equal variance not assumed			0.83	83.74	.41	0.66	

Note: EA= Eco-Anxiety, HW= Habitual Worry, NC= Negative Consequences of Eco-Anxiety

4.8.2 Gender and Environmental self-efficacy

In Table 4.8.3 and 4.8.4, the results of the independent samples t-test between the variables of gender, environmental self-efficacy (ESE), including that of Personal Environmental Agency (PEA) and Collective Environmental Agency (CEA) are presented.

Table 4.8.3: Descriptives for ESE, PEA, CEA and Gender

Variable	Gender	N	Mean	Std. Deviation
ESE	Male	56	123.55	39.87
	Female	158	125.69	33.42
PEA	Male	56	79.96	24.94
	Female	158	82.96	21.90
CEA	Male	56	43.59	17.66
	Female	158	42.73	14.32

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

The hypotheses for the t-test between ESE, PEA, CEA, and gender are as follows:

$H_0: \mu_1 = \mu_2$ (There is no statistically significant difference between the ESE, PEA, and CEA scores of male and female participants)

$H_1: \mu_1 \neq \mu_2$ (There is a statistically significant difference between the ESE, PEA, and CEA scores of male and female participants)

For the overall ESE scores, homogeneity of variance was met for the ESE [$F = 3.35, p = .07$] and PEA scores [$F = 0.35, p = .56$], therefore the t-tests of equal variance assumed was reported on. A t-test for independent samples was performed to compare ESE scores between male and female participants. There was a non-significant difference in the scores for male ($M = 123.55, SD = 39.87$) and female ($M = 125.69, SD = 33.42$) participants; $t(212) = -0.39, p = .70, d = -0.06$. Similarly, the independent sample t-test showed that male participants ($M = 79.96, SD = 24.94$) reported similar scores in their negative consequences of eco-anxiety, $t(212) = -0.85, p = .40, d = -0.13$, as the female participants ($M = 82.96, SD = 21.90$).

For CEA and gender, homogeneity of variance was violated [$F = 5.66, p = .02$], which meant that the output for equal variances not assumed was reported. An independent samples t-test was conducted to compare CEA scores between male and female participants. There was a non-

significant difference in the scores for male ($M = 43.59$, $SD = 17.66$) and female ($M = 42.73$, $SD = 14.32$) participants; $t(212) = 0.33$, $p = .75$, $d = 0.06$. Therefore, the results of these t-tests failed to reject the null hypotheses, as the results indicated that there was no evidence to show a significant difference between gender, ESE, PEA, and CEA scores.

Table 4.8.4: T-test for ESE, PEA, CEA and Gender

		Levene's Test for Equality of Variance		t	df	Test for Equality of Means		Effect size
		F	Sig			Significance Two-sided p	Mean difference	Cohen's d
ESE	Equal variance assumed	3.35	.07	-0.39	212	.70	-2.14	-0.06
	Equal variance not assumed			-0.36	83.97	.72	-2.14	
PEA	Equal variance assumed	1.54	.22	-0.85	212	.40	-2.99	-0.13
	Equal variance not assumed			-0.80	86.90	.43	-2.99	
CEA	Equal variance assumed	5.66	.02	0.36	212	.72	0.86	0.06
	Equal variance not assumed			0.33	82.08	.75	0.86	

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

4.8.3 Age and Eco-Anxiety

As the current study aimed to assess eco-anxiety in young adults, the researcher thought it would be useful to see whether eco-anxiety levels differ between young adults (aged 18-25) and those aged 25 and older. The age variable was recoded into two groups in SPSS, with an age group of those 25 and younger and another group for those older than 25 years. The independent sample t-test was conducted using eco-anxiety as the dependent variable and the age groups as the independent variable. The results are outlined in Table 4.8.5 and Table 4.8.6 .

Table 4.8.5: Descriptive statistics for age and eco-anxiety

Variable	Age	N	Mean	Std. Deviation
EA	25 and Younger	142	55.61	10.06
	Older than 25	76	52.94	10.31
HW	25 and Younger	142	40.49	6.88
	Older than 25	76	38.61	7.49
NC	25 and Younger	142	15.12	4.66
	Older than 25	76	14.33	4.92

Note: EA= Eco-anxiety; HW= Habitual Worry; NC= Negative Consequences of Eco-Anxiety

Homogeneity of variance was met for EA [$F = 0.00, p = .99$], HW [$F = 0.78, p = .38$], and NC [$F = 0.00, p = .98$], therefore the t-tests of equal variance assumed was reported on. The hypotheses for the independent samples t-test between EA, HW, NC and age are as follows:

$H_0: \mu_1 = \mu_2$ (There is no statistically significant difference between the EA, HW and NC scores between those younger than 25 and those older than 25)

$H_1: \mu_1 \neq \mu_2$ (There is a statistically significant difference between the EA, HW and NC scores between those younger than 25 and those older than 25)

Independent samples t-test was conducted to compare EA, HW, and NC scores between those younger than 25 and those older than 25. All three t-tests yielded non-significant results. The difference in the EA scores for those younger than 25 ($M = 55.61, SD = 10.06$) and those older than 25 ($M = 52.94, SD = 10.31$) was non-significant, $t(216) = 1.85, p = .75, d = 0.26$. Similarly, the independent sample t-test showed non-significance between those younger than 25 ($M = 40.49, SD = 6.88$) and those older than 25 ($M = 38.61, SD = 7.49$) in terms of their habitual worry scores, $t(216) = 1.86, p = .06, d = 0.27$. The negative consequences of eco-anxiety were not experienced any differently between those younger than 25 ($M = 15.12, SD = 4.66$) and those older than 25 ($M = 14.33, SD = 4.92$), and was thus non-significant as well, $t(216) = 1.17, p = .24, d = 0.17$

Therefore, the results failed to reject the null hypotheses, as the results indicated no significant differences in how eco-anxiety, habitual worry, and the negative consequences of eco-anxiety are experienced between those younger and older than 25.

Table 4.8.6: T-tests for EA, HW, NC and Age

		Levene's Test for Equality of Variance		t	df	Test for Equality of Means		Effect size
		F	Sig			Significance Two-sided p	Mean difference	Cohen's d
EA	Equal variance assumed	0.00	.99	1.85	216	.07	2.67	0.26
	Equal variance not assumed			1.84	150.09	.07	2.67	
HW	Equal variance assumed	0.78	.38	1.86	216	.06	1.88	0.27
	Equal variance not assumed			1.82	142.63	.07	1.88	
NC	Equal variance assumed	0.00	.98	1.17	216	.24	0.79	0.17
	Equal variance not assumed			1.15	146.21	.25	0.79	

Note: EA= Eco-anxiety; HW= Habitual Worry; NC= Negative Consequences of Eco-Anxiety

4.8.4 Age and Environmental self-efficacy

Similarly, the research also aimed to assess how environmental self-efficacy might differ with different age groups. The results of the t-tests are outlined in Table 4.8.7 and Table 4.8.8.

Table 4.8.7: Descriptive Statistics for Age and ESE

Variable	Age	N	Mean	Std. Deviation
ESE	25 and Younger	142	123.39	33.00
	Older than 25	76	128.18	38.36
PEA	25 and Younger	142	81.38	21.92
	Older than 25	76	83.59	23.80
CEA	25 and Younger	142	42.01	14.03
	Older than 25	76	44.59	17.04

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

The hypotheses for the independent samples t-test between ESE, PEA, CEA and age are as follows:

$H_0: \mu_1 = \mu_2$ (There is no statistically significant difference between the ESE, PEA, and CEA scores between those younger than 25 and those older than 25)

$H_1: \mu_1 \neq \mu_2$ (There is a statistically significant difference between the ESE, PEA, and CEA scores between those younger than 25 and those older than 25)

For the overall ESE scores, homogeneity of variance was met for the ESE [$F = 2.44, p = .12$] and PEA scores [$F = 0.35, p = .56$], therefore the t-tests of equal variance assumed was reported on. An independent samples t-test was conducted to compare ESE scores and age. There was a non-significant difference in the ESE scores for those younger than 25 ($M = 123.39, SD = 33.00$) and those older than 25 ($M = 128.18, SD = 38.36$); $t(216) = -0.97, p = .34, d = -0.27$. Similarly, the independent samples t-test showed that male participants ($M = 81.38, SD = 21.92$) reported similar scores in their personal environmental agency, $t(216) = -0.69, p = .49, d = -0.10$, as the participants older than 25 ($M = 83.59, SD = 23.80$).

For CEA and age, homogeneity of variance was violated [$F = 6.03, p = .02$], which meant that the output for equal variance not assumed was reported. An independent samples t-test was conducted to compare collective environmental agency scores between the two age groups. There was a non-significant difference in the scores for those younger than 25 ($M = 42.01, SD = 14.03$) and those older than 25 ($M = 44.59, SD = 17.04$); $t(216) = -1.13, p = .26, d = 0.17$.

Therefore, the results fail to reject the null hypothesis, as the results indicated that there was no evidence to show that age plays a role in environmental self-efficacy, whether this is at a personal or collective level.

Table 4.8.8: T-tests for Age and ESE, PEA and CEA

		Levene's Test for Equality of Variance				Test for Equality of Means		Effect size
		F	Sig	t	df	Significance Two-sided p	Mean difference	Cohen's d
ESE	Equal variance assumed	2.44	.12	-0.97	216	.34	-4.80	-0.14
	Equal variance not assumed			-0.92	134.89	.36	-4.80	
PEA	Equal variance assumed	0.35	.56	-0.69	216	.49	-2.21	-0.10
	Equal variance not assumed			-0.67	142.94	.50	-2.21	
CEA	Equal variance assumed	6.03	.02	-1.20	216	.23	-2.59	0.17
	Equal variance not assumed			-1.13	130.21	.26	-2.59	

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

4.8.5 Geographic Location and Eco-anxiety

The literature has also outlined how there are differences in eco-anxiety levels between those in urban areas and those residing in rural areas (Leonhardt et al., 2022), and how no differences are found between those living in urban and rural areas (Mania, 2024). The researcher wanted to investigate whether a difference was also observed in South Africa. The residential location variable was recoded into two groups in SPSS, with a group for those living in urban areas (which included all the participants who indicated they lived in urban, semi-urban and township areas), and those living in rural areas. The independent sample t-test was conducted using eco-anxiety as the dependent variable and the urban and rural residential demographic as the independent variable. The results of t-test are outlined in Table 4.8.9 and Table 4.8.10.

Table 4.8.9: Descriptive statistics for Eco-Anxiety and Geographic Location

Variable	Geographic Location	N	Mean	Std. Deviation
EA	Urban area	199	54.89	10.01
	Rural Area	19	52.39	12.15
HW	Urban area	199	40.03	7.05
	Rural Area	19	37.72	7.90
NC	Urban area	199	14.86	4.74
	Rural Area	19	14.66	5.06

Note: EA= Eco-anxiety; HW= Habitual Worry; NC= Negative Consequences of Eco-Anxiety

Homogeneity of variance was met for EA [$F = 0.93, p = .34$], HW [$F = 0.54, p = .46$], and NC [$F = 0.14, p = .70$], therefore the t-tests of equal variance assumed was reported on.

The hypotheses for the independent samples t-test between EA, HW, NC and Geographic location are as follows:

H₀: $\mu_1 = \mu_2$ (There is no statistically significant difference between the EA, HW and NC scores between those who come from urban areas and those who come from rural areas)

H₁: $\mu_1 \neq \mu_2$ (There is a statistically significant difference between the EA, HW and NC scores between those who come from urban areas and those who come from rural areas)

Independent samples t-test was conducted to compare EA, HW, and NC scores. The difference in the EA scores for urban ($M = 54.89, SD = 10.01$) and those rural ($M = 52.39, SD = 12.15$) was non-significant, $t(216) = 1.02, p = .31, d = 0.25$. Similarly, the independent sample t-test showed non-significance between urban ($M = 40.03, SD = 7.05$) and rural ($M = 37.72, SD = 7.90$) in terms of their habitual worry scores, $t(216) = 1.35, p = .18, d = 0.32$. The negative consequences of eco-anxiety were not experienced any differently between those who reside in urban ($M = 14.86, SD = 4.74$) and rural ($M = 14.66, SD = 5.06$) areas, and was thus non-significant as well, $t(216) = 0.17, p = .86, d = 0.04$. Therefore, the results fail to reject the null hypothesis, as the results indicated no significant differences. This means that where one resides does not make a difference in how eco-anxiety, habitual worry, or negative consequences of eco-anxiety are experienced.

Table 4.8.10: T-tests for EA, HW, NC and Geographic Location

		Levene's Test for Equality of Variance				Test for Equality of Means		Effect size
		F	Sig	t	df	Significance Two-sided p	Mean difference	Cohen's d
EA	Equal variance assumed	0.93	.34	1.02	216	.31	2.51	0.25
	Equal variance not assumed			0.87	20.40	.39	2.51	
HW	Equal variance assumed	0.54	.46	1.35	216	.18	2.31	0.32
	Equal variance not assumed			1.23	20.83	.23	2.31	
NC	Equal variance assumed	0.14	.70	0.17	216	.86	0.20	0.04
	Equal variance not assumed			0.16	21.12	.87	0.20	

Note: EA= Eco-anxiety; HW= Habitual Worry; NC= Negative Consequences of Eco-Anxiety

4.8.6 Geographic Location and Environmental self-efficacy

Similarly, as for Eco-anxiety and Geographic location, independent samples t-tests were conducted for environmental self-efficacy and its subscales.

Table 4.8.11: Descriptive Statistics for ESE and Geographic Location

Variable	Geographic Location	N	Mean	Std. Deviation
ESE	Urban area	199	124.25	34.46
	Rural Area	19	133.53	39.73
PEA	Urban area	199	81.69	22.30
	Rural Area	19	87.00	25.31
CEA	Urban area	199	42.56	15.04
	Rural Area	19	46.53	16.39

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

Homogeneity of variance was met for ESE [$F = 0.37, p = .55$], PEA [$F = 0.09, p = .76$], and CEA [$F = 0.41, p = .52$], therefore the t-tests of equal variance assumed was reported on. The

hypotheses for the independent samples t-test between ESE, PEA, CEA and Geographic location are as follows:

$H_0: \mu_1 = \mu_2$ (There is no statistically significant difference between the ESE, PEA, CEA scores between those who come from urban areas and those who come from rural areas)

$H_1: \mu_1 \neq \mu_2$ (There is a statistically significant difference between the ESE, PEA, CEA scores between those who come from urban areas and those who come from rural areas)

The difference in the ESE scores for urban ($M = 124.25$, $SD = 34.46$) and those rural ($M = 133.53$, $SD = 39.73$) was non-significant, $t(216) = -1.11$, $p = .27$, $d = -0.27$. Similarly, the independent sample t-test showed non-significance between urban ($M = 81.69$, $SD = 22.30$) and rural ($M = 87.00$, $SD = 25.31$) in terms of their PEA scores, $t(216) = -0.98$, $p = .33$, $d = -0.24$. The CEA was not experienced any differently between those in urban ($M = 42.56$, $SD = 15.04$) and rural ($M = 46.53$, $SD = 16.39$) areas, and was thus non-significant as well, $t(216) = -1.09$, $p = .28$, $d = -0.26$. Therefore, the results failed to reject the null hypothesis, indicating no differences in where one resides and how environmental self-efficacy is experienced.

Table 4.8.12: T-test for Geographic Location and Environmental self-efficacy

		Levene's Test for Equality of Variance		t	df	Test for Equality of Means		Effect size
		F	Sig			Significance Two-sided p	Mean difference	Cohen's d
ESE	Equal variance assumed	0.37	.55	-1.11	216	.27	-9.28	-0.27
	Equal variance not assumed			-0.98	20.67	.34	-9.28	
PEA	Equal variance assumed	0.09	.76	-0.98	216	.33	-5.31	-0.24
	Equal variance not assumed			-0.88	20.76	.39	-5.31	
CEA	Equal variance assumed	0.41	.52	-1.09	216	.28	-3.96	-0.26
	Equal variance not assumed			-1.01	21.00	.32	-3.96	

Note: ESE= Environmental Self-Efficacy, PEA= Personal Environmental Agency, CEA= Collective Environmental Agency

Summary of results from this chapter

- This chapter presented the sample's most important to least important issues, with the most important issues of concern being 'Personal issues', 'Religious Concerns' and 'Personal Safety'.
- Thereafter, a CFA was conducted to test the factor structure of both the EAQ-22 and the ESE-20. The two-factor EAQ-22 remained valid in the South African context. As the ESE-20 proved to have a poor model fit, an EFA was conducted to explore what a better factor structure would be. The ESE-20 was refined into a two-factor structure, which differentiated from the unidimensional model of the original scale.
- To ensure reliability of the scales used, Cronbach's alphas indicated that both the EAQ-22 and ESE-20 have excellent reliability, with their respective subscales showed 'good' to 'excellent' reliability as well.
- A non-significant relationship was found between eco-anxiety and environmental self-efficacy, as revealed by the Pearson correlation.
- Lastly, there were no significant differences in eco-anxiety and environmental self-efficacy scores between gender, age or geographic location groups.

CHAPTER 5: DISCUSSION, LIMITATIONS & RECOMMENDATIONS

This study investigated the relationship between eco-anxiety and environmental self-efficacy of young South African adults. It was one of the first to analyse eco-anxiety in South Africa and this chapter discusses the findings. The study required utilising measuring instruments for both eco-anxiety (EAQ-22) and environmental self-efficacy (ESE-20), which have not been previously utilised in South Africa. As a result, psychometric analyses of both scales were conducted, which assessed validity and reliability. This chapter highlights the findings of the factor analyses, as well as the subsequent correlation and independent samples t-tests. Furthermore, this chapter outlines the limitations of the study and provides some recommendations for future research.

5.1 Scale reliability and validity in the South African context

5.1.1 The EAQ-22 measuring instrument.

This study was the first to make use of these scales in the South African context, which is why it was appropriate to assess the factor structure, the validity and reliability of the EAQ-22 and ESE-20 instruments. A CFA with maximum likelihood was used to investigate the structure of the EAQ-22. In terms of the EAQ-22, the results of the CFA indicated that the two-factor structure proposed by the developers of the scale, that is Habitual Worry as factor 1 and Negative consequences of eco-anxiety as factor 2, was a well-suited structure for exploring these constructs within the South African context. This was further confirmed by the convergent validity that was assessed using the factor loadings and AVE method suggested by Cheung et al. (2024). The factor loadings were all above the minimum acceptable loading of 0.40, which has been shown as the best cut-off for meaningful construct contributions. The AVE, although below the minimum cut-off of 0.50, was still acceptable as the CR was sufficiently high (Fornell & Larcker, 1981). The model fit, using Gupta and Singh's (2015) fit indices thresholds, was seen to be an acceptable model as all indices fell within the 'acceptable' to 'good' fit ranges. Furthermore, the high reliability of the EAQ-22 scale as a whole ($\alpha = .90$), as well as the Habitual worry ($\alpha = .89$) and Negative consequences of eco-anxiety ($\alpha = .85$) subscales, indicated that the items in the scale provide stable consistency in measuring the construct of eco-anxiety. This study hypothesised that the original EAQ-22 would be valid and reliable.

This was supported by the results, which indicated that EAQ-22 is a robust tool that can be applied in the South African context for future studies, as it will maintain structural integrity.

5.1.2 The ESE-20 measuring instrument.

A CFA with maximum likelihood was used to investigate the structure of the ESE-20. Although the original unidimensional factor structure of the ESE-20 produced factor loadings greater than 0.4, with loadings ranging from 0.43 to 0.81, the one-factor structure was shown as an inadequate model. The model indicated poor fit, with all fit indices being below the recommended thresholds provided by Gupta and Singh (2015). This study hypothesised that the original ESE-20 would be valid and reliable, however, this was not supported by the results. Therefore, an EFA was conducted to explore what a better underlying factor structure would be. The EFA was conducted using the Principal Axis Factoring (PAF) approach, with a Promax rotation.

The results of the EFA indicated that a two-factor structure was what provided the best representation of the ESE-20. In exploring alternative factor structures, the researcher found that the two-factor structure model was the best, as a rotation could not be performed for a one-factor structure and a three- and four-factor models yielded factors that contained only two items each. In terms of scale properties, a factor should ideally have more than three items for it to have meaningful construct validity (El-Den et al., 2020). Therefore, the decision was made to use the two-factor structure. These two factors were named the Personal Environmental Agency (PEA) and Collective Environmental Agency Scale (CEA), which is discussed in greater depth in section 4.4. Bandura (1997) outlines that personal agency and collective agency, although distinct, are interrelated elements that make up the construct of perceived control. As the ESE-20 was developed in Switzerland, a developed country that is homogenous in terms of its sociocultural and economic make-up, environmental self-efficacy may be perceived very differently in the South African context. This further cements the idea that individualistic and collectivist cultural ideologies come into play with environmental self-efficacy.

The reliability of the overall ESE-20 scale, as well as the two new subscales that emerged, was assessed using Cronbach's Alpha. For a scale to exhibit good internal consistency of the items, Cronbach's alpha should be above 0.7 (Field, 2013). The overall ESE-20 showed excellent internal consistency ($\alpha = 0.93$), whereas the subscales PEA and CEA demonstrated excellent

reliability as well ($\alpha = 0.92$ and $\alpha = 0.84$ respectively). Therefore, it was concluded that the ESE-20 was a reliable measure that could be utilised in the South African context.

5.2 Eco-anxiety and Environmental Self-efficacy in the South African context

The sociocultural and economic factors that play a role in shaping what is prioritised in terms of the most important concerns by young adults, were analysed in terms of how this may influence eco-anxiety and environmental self-efficacy. This study hypothesised that environmental issues would not be seen as a primary issue of importance by young adults, which was supported by the findings. The results revealed that for South African young adults, environmental issues were ranked relatively low in relation to the other pressing concerns they face, with a majority indicating that the overall concerns were focussed on ‘personal issues’, ‘religious concerns’, ‘personal safety’ and ‘economic issues’. Environmental concerns, which include worrying over issues such as climate change and ecological destruction, are what the literature has outlined as a key determinant of eco-anxiety - the focus of this study. It was important to see where environmental concerns are placed to contextualise eco-anxiety and environmental self-efficacy in young adults, for further interpretations of the analysis discussions that are to follow.

The results of the current study align with previous South African literature on environmental attitudes. Struwig (2010) and De Wet-Billings (2023) have previously outlined, using the SASAS data of 2005 and 2017, that environmental issues are not a primary concern for many South African individuals, as the focus tends to be shifted to the broader societal problems. These findings of Struwig (2010) and De Wet-Billings (2023), as well as the results of the current study, despite the time gap between surveys, have demonstrated consistency and stability in the attitudes individuals have shown toward the environment for nearly two decades in South Africa. This lack of change in attitudes toward environmental issues indicates that over time, sociocultural and economic issues such as unemployment, crime, inter-faith conflicts, or personal concerns, remain persistent issues that South Africans dedicate their focus on.

Understanding this from a psychological perspective, Maslow’s Hierarchy of Needs (1954) or Inglehart’s (1995) Post-Materialist Theory can help explain this. Maslow’s Hierarchy of Needs (1954) explains how individuals have hierarchical needs, starting with physiological needs for survival, followed by safety needs, psychological needs of love and belonging, and ending with

the self-fulfilment needs at the top of the hierarchy. The primary concerns of the participants - personal issues, personal safety, religious issues, and economic concerns- all fit in the bottom three hierarchical needs. Environmental concern would be classified as a higher-level need, i.e. a self-actualisation need, which individuals aim to acquire to develop a stronger sense of well-being (Zhai et al., 2023). In the South African context, many South Africans are still trying to satisfy their physiological and safety needs, leaving little room for depleting cognitive, emotional, and physical resources to a 'long-term' issue. For many, environmental concern is seen as a luxury that only people who have their basic needs met, can be concerned about (Martinez-Alier, 1995). This is essentially what Post-Materialist Theory highlights (Inglehart, 1995), where individuals who live with affluent socio-economic conditions are able to make environmental issues a more central concern. The prevailing inequalities that individuals have to divert their attention on, widens the psychological distance between an individual's immediate material needs of survival and safety, and the post-material priorities such as protection of degrading ecological and climate systems. This aligns with what Sulemana et al. (2016) have argued in their research, that 19.70% of South Africans prioritise environmental protection over economic issues of the country.

The findings of the Eco-anxiety questionnaire present a contrast in the responses of the two subscales. The 'habitual worry' subscale provided a good indication of consistent concern experienced by people for environmental concerns. It was observed that for these items, the most common responses were 3 '*somewhat agree*' and 4 '*strongly agree*' on the Likert-type responses. This provided a fair indication that the young adult population of South Africa was concerned about ecological, environmental, and climate change. Contrarily, when looking at the Negative Consequences subscale, the most common responses for items 3, 5, 8, 10, 13, 16, 18, 21, and 22 were Likert responses of 1, '*strongly disagree*' and 2, '*somewhat disagree*'. Although there was an awareness and concern for changes occurring in ecological systems, the findings indicate a disconnection between the worry experienced by young adults and the negative personal impacts of eco-anxiety. Young adults do not experience the consequences of environmental and climate change as severely as other countries; therefore, the youth may feel geographically or temporally displaced (Spence et al., 2012). The negative effects of eco-anxiety were also not experienced as severely, due to the socio-economic issues consequences discussed above being experienced more adversely.

As personal safety was ranked as the third most important issue, living in a country with such high crime rates was shown to affect an individual's well-being negatively (Cordeiro et al., 2020). Feeling unsafe in one's home, especially at night, as well as walking in the streets at night cause great psychological distress to individuals in Gauteng, South Africa, which decreases life satisfaction (Cordeiro et al., 2020). Religious concerns arise when life stressors, such as those mentioned in the study of personal safety, personal issues, and economic stressors, all influence "a person's orienting system of core beliefs, practices, values, and social connections" (Jung et al., 2022, p. 305). Jung et al. (2022) also found that religious and spiritual struggles correlate with increased depression in South African adults. Bhana (2024) highlights that individuals who are worried about the state of the economy (with issues such as unemployment, load-shedding, and high costs of living) combined with personal and work-related problems, have caused significant increases in stress, depression, burnout, and general anxiety. The combined effect of all these socio-economic problems has more significant negative effects experienced in comparison to those of eco-anxiety, negatively impacting the well-being of South Africans.

5.2.1 Interpreting the EAQ-22 scores.

As observed from the descriptive statistics, young adults in the sample exhibited moderately high levels of eco-anxiety. This coincides with the findings that were discussed in the literature, where young adults globally are reporting moderately high to high levels of eco-anxiety (Tam et al., 2023). In the South African context, this result can be interpreted in conjunction with the anxieties faced in the daily lives of young adults, which looked at the highest number of responses per concern with the top three issues being Personal Issues, Religious Concerns, and Personal Safety. The study did find that only 3.4% ($n = 6$) of the respondents indicated that environmental issues were their main primary concern, with a total of 20.8% ($n = 37$) having environmental issues as one of their top 3 current concerns. If this were to be compared to what the study found as the most important concern, which was personal issues that consisted of academics, family, identity, and finances, 30.7% ($n = 55$) indicated this was their primary concern, with a total of 46.9% ($n = 84$) having this as one of their top three main concerns. Religious concerns found that 11.7% ($n = 21$) had this as their primary concern, with a total of 25.7% ($n = 46$) having this as one of their top three main issues of current concern. Lastly, the third most important issue shown to be of importance to young adults in South Africa was that

of personal safety, with 10.6% of the sample indicating this was their primary concern and a total of 29.5% ($n = 53$) having this as one of their main three concerns.

If one has to compare the figures of environmental concerns to personal, religious, and personal safety concerns, it was obvious that a lot of young adults' focus was shifted to these issues, where it was most likely that more of their anxiety was accumulated. These findings suggest that while eco-anxiety was present at moderately high levels, it was not the dominant source of stress and worry for young adults in South Africa. As the literature has outlined (Martinez-Alier, 1995), environmental issues tend to be an area of primary concern in developed countries where basic resources and services are provided to their citizens, which grants them the luxury of being able to prioritise environmental issues. In this hierarchy of concerns, the sociocultural and economic conditions of South Africa are overshadowed by economic instability, crime, and social inequalities, ultimately displacing the urgency of global warming or ecological disasters. This lower prioritisation of environmental concerns does not come as an unanticipated finding. As a result of this displacement for many of the participants, the impact of eco-anxiety may manifest to a different degree in South Africa where it is likely that the levels of eco-anxiety are much lower compared to young adults where environmental issues are more at the forefront of concerns.

When observing the most common responses for the negative consequences of eco-anxiety subscale, which consists of behaviours such as crying, insomnia, muscle tension, poor performance, and over-alertness; it was observed that a majority of participants responded with 1 '*strongly disagree*' and 2 '*somewhat disagree*'. The means for the items of the negative consequences of eco-anxiety subscale ranged from 1.35 to 2.06, indicating that for the overall responses for these items, the severe manifestations of eco-anxiety were not really experienced by young adults in the study. This was observed through the means of the items on this subscale being much closer to the minimum of the scale (1), which shows that young adults experienced eco-anxiety but it has not yet reached a point where it led to maladaptive behavioural symptoms that interfere with their daily lives.

In contrast, in the Habitual Worry subscale the most common responses to the items that comprised feelings such as worry, anger, empathy, frustration, and unease toward environmental problems; all were between the scores of 3 '*Somewhat agree*' and 4 '*Strongly agree*'. The means of these items also ranged from 2.53 to 3.39, indicating that individuals

tended to agree more with statements that express attitudes of eco-anxiety. The relatively high means show that young adults are actively aware of the problems that are arising with ecological and climate change, and are concerned about the consequences that are occurring in real time. The differences that are seen between these two subscales were important to note in the South African context. Although young adults expressed that they demonstrated high levels of habitual worry, the concern has not reached a point where it was either physically or psychologically debilitating to them. As mentioned previously, the numerous socio-economic concerns endured by young adults may result in negative consequences being experienced, such as insomnia or muscle tension (Doherty & Clayton, 2011; Usher et al., 2019). These could arise from the personal, religious, safety, and economic concerns they have currently occurring in their lives.

The findings suggest that the eco-anxiety experienced by South African young adults was rather nuanced, with the two contrasting differences shown, as highlighted between the habitual worry and negative consequences subscales. Young adults were invested emotionally and had a heightened awareness of environmental issues, however, the connection to these concerns was not deep enough to affect their mental and physical health. Poortinga et al.'s (2023) study on generational differences in perceptions and beliefs about climate change revealed similar findings to the current study. It was found that emotions such as fear and outrage were expressed by Generation Z and Millennials, but not to a point where it resulted in maladaptive responses or functioning (Poortinga et al., 2023). Therefore, it can be observed that eco-anxiety amongst the participants was expressed as awareness and concern that was driven by empathy and a sense of responsibility towards the environment.

5.2.2 Interpreting the ESE-20 scores.

As the sample has scored moderate to high scores on the overall ESE (Table 4.6.2, Appendix K), this shows that young adults do have confidence in their ability to address environmental issues, whether on a personal or collective level. However, the results showed a lot of variability in environmental self-efficacy scores. This was thought to be attributed to demographic factors; however, this was not the case as outlined in sections 5.4 and 5.5 to follow. Furthermore, this could be attributed to the self-efficacy that young adults have in relation to the current issues they prioritised discussed above. Individuals may not have confidence in their ability to address

environmental issues, as they struggle with the capabilities to deal with the other ongoing socio-cultural concerns in their lives. Resource availability to deal with the socio-economic challenges that already exist are limited, which could influence their perceptions for making change with regard to environmental issues. Orlandi et al. (2024), although an organisational based study on remote work, have highlighted how various resource availability and access play a critical role in enhancing self-efficacy and anxiety. This sentiment can be carried over to the current study, where the lack of resources made available for young adults, steadily diminishes environmental self-efficacy.

In looking at the mode for each item of the ESE scale (Table 4.6.2, Appendix K), with scores of 7 to 10 indicating higher environmental self-efficacy, items 1, 5, 6, 7, 10, 11, 12, 14, 15, 16, 17, 18, 19, and 20 were most commonly answered with scores 7 to 10. This indicated that the youth possess high confidence in their ability to engage with greener and sustainable behaviours. Their perceived confidence decreased slightly, with the mode for items 2, 3, 4, 9, and 13 scoring between 4 and 6 which indicates moderate levels of environmental self-efficacy. Item 8 was the only item where the most common response was 0, indicating no confidence in their ability to implement this behaviour into their daily lives. Furthermore, the means range from 4.40 to 7.53 for all the items, indicating their perceived confidence in their ability to make positive change remains consistently moderate.

Bandura (1977) suggests that self-efficacy is higher when individuals have direct control or influence on the actions or behaviours they try to express. As mentioned throughout this study, the socio-economic concerns of young adults serve as systemic barriers to how they are able to take action. For example, looking at the items with the highest means, item 10 “I can choose to be an environmentally friendly consumer” ($M = 7.53$, $SD = 2.42$), and item 19 “I can learn more about new environmental issues as they become” ($M = 7.52$, $SD = 2.35$), are two areas where young adults can have direct control of their actions. Social media such as YouTube, Instagram, and TikTok, play a crucial role in how young adults stay informed and learn about global issues as they become relevant, including environmental issues (Shutaleva et al., 2021). This offers young adults vicarious experiences as they build their knowledge on environmental issues and sustainable behaviours, enabling them to make better informed decisions and develop the belief that they can take action (Bandura, 1977). In turn, engaging with solutions through social media such as vicariously learning about sustainable behaviours such as clothing thrifting through influencers, a means of purchasing second-hand clothing which has become very prevalent

among young adults (Dąbrowski et al., 2022; Petersson-Eid et al., 2024; Sham et al., 2024; Stevenson et al., 2022), leads to mastery experiences. Young adults successfully incorporate these consumer choices, such as thrifting, into their lifestyle habits, which in turn results in higher environmental self-efficacy and stronger beliefs in the ability to make positive change.

Taking into account the lowest means of the responses, it was observed that items 4 “I can reduce the environmental problems that the next generation will need to face in the future” ($M = 4.63$, $SD = 2.61$), and item 8 “I can choose forms of transportation that cause fewer carbon emissions” ($M = 4.40$, $SD = 3.05$), had the lowest means. This provides an indication that young adults in the study felt less confident in their abilities to bring about change in these areas. Young adults themselves are trying to rectify the state of the environmental and climate issues that were passed onto them from previous generations, while simultaneously grappling with the numerous socio-economic issues that are unique and prevalent in the South African context. This could be one of the reasons why item 4 and the concept of the “next generation” have lower self-efficacy and agency, as individuals are attempting to make environmentally friendly choices that are able to better their lives in the present. Furthermore, a disconnect exists between the current actions individuals make, as a result of limited resources or the psychological distance mentioned prior, and the outcomes this will have in the future.

With item 8 ($M = 4.40$, $SD = 3.05$), the mode of these responses was 0 ‘No certainty at all’, indicating extremely low environmental self-efficacy to choose environmentally friendly transportation. Public transportation such as minibus taxis and busses are frequently utilised by individuals in South Africa (Ngcobo et al., 2024). Although this method results in fewer single-passenger vehicles, which leads to fewer emissions, minibus taxis and buses are heavily fossil-fuel powered, which counteracts the actions of sustainable transportation choices. The lack of safe infrastructure provided for human-powered transportation such as cycling or walking (Nethengwe, 2022; Ngcobo et al., 2024), makes these options unsafe for daily commuting, diminishing individual self-efficacy toward making practical and sustainable transportation choices. Ngcobo et al. (2024) also explain that there was minimal political dedication and investment in sustainable and energy-efficient transportation in South Africa. Additionally, as highlighted through the concern of personal safety that is expressed by many young adults in the study, a fear of using public transportation such as minibus taxis, as they are exposed to dangerous driving, violence, and harassment in these minibus taxis (Eagle & Kwele, 2021). Furthermore, many prefer private transportation as this was a more reliable and safer form of

transport (Nethengwe, 2022). This all impacts young adults psychologically, as they are aware of what the carbon emissions do by choosing private forms of transportation, however, they are left feeling helpless and anxious as a result of systemic barriers.

Psychological distance (McDonald et al., 2015; Schuldt et al., 2018; Spence et al., 2012; Van Valkengoed et al., 2023) is the perception of how far or near an issue feels to an individual in relation to time, place, or connection. South African young adults were more likely to see the threat of environmental degradation as a long-term issue, while more immediate concerns such as religion, identity, academics, personal safety, or employment, demanded their attention. In turn, young adults were faced with anxieties related to these issues, reducing their perceived eco-anxiety as they invested all their physical, psychological, and emotional resources into the other daily challenges. This psychological distance, however, does not mean that the young adults were oblivious or lacked awareness of environmental issues; there was just compartmentalisation of issues that were driven by more pressing issues that impact everyday survival. In line with this aforementioned statement, environmental issues are framed within religious domains (Kaushal, 2023; Le Duc, 2017, Mi et al., 2020), which was the second most important concern for young adults. Although environmental concerns were seen as a primary concern for far fewer individuals, some religions position environmental issues as part of religious teachings, where these are part of a divine plan (Gardner, 2003; Kula, 2001). This is also a factor that could reduce an individual's eco-anxiety and agency as these are elements that are beyond one's own control and are left in the hands of a greater power.

This distance has an impact on how environmental self-efficacy presents itself, as individuals may find it difficult to perceive the relevance of their actions to a problem that they feel less connected to. Adding onto this, young adults potentially feel that their ability to make a difference was undermined by the lack of or insufficient government interventions toward environmental issues (Lorenzoni et al., 2007). South Africa has numerous barriers to stable employment, personal safety, and economic development which young adults have to overcome. Shifting one's focus and investing resources in an issue that was not deemed as important in our society, can essentially be perceived as a luxury to some.

5.3 The Relationship between Eco-anxiety and Environmental Self-Efficacy

The Pearson correlation analyses revealed that no statistically significant relationship exists between eco-anxiety and environmental self-efficacy, with no relationships occurring between the subscales of each measure either. This indicates that any variations in environmental self-efficacy would not be related to a change in eco-anxiety, and vice versa. It can be argued that from this finding that even with moderate to high environmental self-efficacy, it does not mean that it will help in regulating or mitigating emotional responses such as eco-anxiety. Relating this to the theoretical framework of the study, Social Cognitive Theory (SCT), one can argue that ineffective vicarious experiences for environmentalism from government or community leaders (Falayi et al., 2021; Lin et al., 2022) can result in negative outcome expectations. There was a lack of sufficient support and opportunities for sustainable mastery experiences, to turn beliefs into practical action.

The initial hypothesis proposed for this relationship was a significant negative relationship where those with higher environmental self-efficacy would experience lower levels of eco-anxiety due to what was brought forth in the literature of individuals feeling a greater sense of control and agency over environmental issues and the outcomes of sustainable behaviour. Conversely, those with lower environmental self-efficacy were expected to have heightened eco-anxiety levels. This was initially hypothesised by the researcher on the premise that self-efficacy brings a greater sense of control, which would allow individuals to have more control over the impact they have on the environment which would reduce the feelings of helplessness that lead to worrying (Bandura, 1997). Furthermore, the researcher investigated whether relationships would possibly exist between the subscales of eco-anxiety and environmental self-efficacy that is to see if a relationship existed between habitual worry, negative consequences of eco-anxiety, personal environmental agency, and collective environmental agency. The correlation analyses revealed that all these relationships were non-significant, highlighting that no relationship existed between habitual worry, personal and collective environmental agency, as well as no relationship between negative consequences of eco-anxiety and personal and collective environmental agency.

Additionally, a factor that may have contributed to the absence of a relationship existing between these two variables, was as a result of what was observed in the responses of the EAQ-22 subscales. Habitual worry was high, however, participants did not experience the negative consequences, indicating that the eco-anxiety felt by participants was passive (Parreira &

Mouro, 2023; Pihkala, 2020). Young adults were eco-anxious, however, not to the point where they felt it affected their lives in a harmful way where they felt motivated to take action, an important aspect of self-efficacy (Bandura, 1977). The negative consequences of eco-anxiety are not seen, especially not as prominently as the negative consequences of all the socio-economic and personal anxieties that young adults face. For example, seeing what unemployment does in terms of not having a stable source of income, and how this impacts the livelihoods of oneself and dependents in terms of being able to provide them with resources. However, simply hearing about the consequences of plastics in the ocean may not be as much of an immediate concern that motivates young adults to take action. Therefore, the idea that Lutz et al. (2023) discuss of state-like eco-anxiety may be what South African young adults experience. The eco-anxiety they feel may be triggered by certain events or for a brief period of time, however, this is not sustained long enough as their focus has to shift onto one of the many other concerns they face. As young adults may potentially only embody state-like eco-anxiety, it can rarely translate and develop into long-term environmental self-efficacy.

As the research has outlined, the broader socio-economic concerns that were prioritised by young adults over environmental issues may be a potential reason no relationship between these two constructs exists (De Wet-Billings, 2023; Struwig, 2010). These concerns, as discussed previously, include safety, economic issues, religious concerns, and personal concerns, social and technological concerns- each already contributing to young adult's anxiety. With so many systemic barriers hindering existing concerns from being addressed, the barriers to addressing ecological and climate change for young adults to take environmental action are even more limiting. Therefore, eco-anxiety may be intertwined and embedded within all these other already long-existing anxieties, where concerns about young adults' futures were not solely focused on the state of the planet, but also the state of their future survival in terms of employment, crime, and inequality (Marais-Potgieter & Thatcher, 2022). As mentioned in sections 5.1.1 and 5.2.2, habitual worry has heightened levels contributing to eco-anxiety, however, the negative consequences were not experienced by South African young adults. There was an awareness and concern for the future state of the planet, however, this concern may not translate into attainable action as it requires many large-scale efforts of change from government and communities rather than individual efforts. This, in turn, results in a disconnection between what young adults believe they can achieve in terms of environmental action agency and the eco-anxiety they experience.

The results indicated that whether eco-anxiety is high or low, it was not affected by fluctuations in environmental self-efficacy. This lack of relationship could be attributed to several barriers that could possibly limit the environmental self-efficacy beliefs of the South African population. Although there is a growing environmental concern, resulting in increased levels of awareness and eco-anxiety, the young South African may feel disempowered to make change, especially at an individual level, but more so at a community level. South Africa has inadequate financial resources, lack of political will, no climate change plans or mandates placed at local and national levels, as well as limited knowledge of climate, and ecological change not only by those tasked with environmental duties but also by the general public (Selormey et al., 2019; Sibiya et al., 2023).

Lastly, one could attribute these correlational findings to the cultural context of South Africa. The principle of Ubuntu, where individuals place emphasis on collective well-being and group efforts, is favoured in the local context to a greater extent than individualism (Metz, 2011). The ESE-20 measures a lot more individual self-efficacy beliefs, motivations, and actions in comparison to collective self-efficacy. This brings forth an individualistic approach to making a change that may not have resonated well with young adults who grew up in a country with collectivist values. This could have also potentially weakened the hypothesised relationship.

5.4 The demographics of Eco-anxiety

To understand whether demographic factors influenced eco-anxiety levels, independent samples t-tests were conducted for various groups including gender, age, and geographic location. These tests all produced non-significant differences between each group assessed, that is, no differences were found in how eco-anxiety was experienced between males and females, between those younger and older than 25, and between those who come from urban or rural areas.

Eco-anxiety has been shown to manifest differently across genders (Hickman et al., 2021). However, in the South African context, there was not much difference in how eco-anxiety was experienced between male and female participants. As mentioned previously, young adults face a number of challenges with regard to the multiple socio-economic factors that contribute to their anxiety, regardless of gender. South African men and women have to divert their attention to the more immediate concerns of crime, gender-based violence, or unemployment (Cordeiro et al., 2020; Eagle & Kwele, 2021). Furthermore, it is important to note that the gender

distribution in the sample was disproportionate. 72.1% of the responses for the study came from female participants, which contributed more to the overall variance of eco-anxiety scores.

In terms of age, previous research has shown that those younger than 25 years old tended to express higher levels of eco-anxiety and climate anxiety globally (Ediz & Yanik, 2023; Galway & Field, 2023; Hickman et al., 2021). Hickman et al.'s (2021) study explains that the younger generation sees climate change and ecological destruction as a direct threat to their futures, which explains why the youth express greater levels of eco-anxiety. Based on this, the researcher hypothesised that those younger than 25 would have heightened eco-anxiety, however, the non-significant results do not align with the literature with regard to the youth in South Africa. What is important to note, which is what Poortinga et al. (2023) have differentiated in their study, is that climate awareness and beliefs remain relatively consistent between younger and older individuals. All individuals, regardless of their age, were experiencing the effects of climate change and ecological destruction, while simultaneously experiencing the ongoing life stressors of the country.

The independent samples t-tests revealed no significant difference in eco-anxiety between those who live in urban areas and those who live in rural areas. Yet again this differentiated from what previous literature has outlined (Mania, 2024) and the researcher's hypothesis, that those in urban areas experience higher levels of eco-anxiety. One of the possible reasons for this non-significance difference could be attributed to the big disparity in terms of the sample composition of those who come from rural areas ($n = 19$) and those in urban areas ($n = 199$).

Overall, as a result of the collectivist culture that South African individuals live by (Oyserman et al., 2002), this may be a mitigating factor that can potentially account for the non-statistically significant difference in eco-anxiety levels across the demographic variables of gender, age and geographic location. With this culture, individuals potentially see eco-anxiety not as an individual problem, but rather as something experienced as a communal problem. This is because the environment, this being parks, beaches, or mountains, are all collective spaces where people gather. Thus, if environmental challenges arise, it may cause heightened feelings of worry which instils some shared responsibility.

5.5 The demographics of Environmental Self-Efficacy

The independent samples t-test for environmental self-efficacy also yielded non-significant differences between male and female participants, those younger and older than 25 years old, and between those living in urban and rural areas.

The literature (Bamberg & Möser, 2007; Ojala, 2018) has shown how gender does have statistically significant differences in terms of general self-efficacy and environmental self-efficacy. Therefore, this became a point of interest for the researcher, to explore whether the gender of young adults would influence their environmental self-efficacy beliefs. Prior to conducting the t-test, the researcher hypothesised that young adult women would have higher environmental self-efficacy compared to men. This assumption was based on the study of Ojala (2018) with their findings indicating that young women in Sweden reported higher green self-efficacy compared to men. The researcher also made the general assumption that women, due to their ability to show greater concern for activism, would display higher levels of environmental self-efficacy. The findings of the independent samples t-test differ from what the researcher originally hypothesised, as the findings indicated that there were no gender differences in environmental self-efficacy.

The non-significant difference in terms of gender could be attributed to societal norms. Men are generally seen to hold positions of power, where they tend to be decision-makers in environmental policies and sustainability projects (Heeren et al., 2022). This positioning, not only in government but also in general society that still has very dominant patriarchal views, reinforces the sense of agency and control men have in their ability to bring about action for environmental change. This allows men to perceive themselves as problem-solvers, which results in higher environmental self-efficacy. Along the same line, women have been seen to be at the forefront of environmental activism as they express greater concern and a stronger sense of agency for environmental protection (Hannouch & Milstein, 2024). Young female participants may believe that they can enact sustainable behaviours, but due to structural barriers such as men being decision-makers and problem-solvers, this does not translate into something attainable. Furthermore, the non-significant difference is attributed to a shift in the way young adults may perceive their environmental self-efficacy, as observed by the very similar mean scores between male and female participants.

In terms of age, the non-significant difference could also be attributed to resource access and availability. Young adults are able to educate themselves much more about environmental issues through social media, allowing them to learn about sustainable behaviour practices (Gunasiri et al., 2022). However, their belief in themselves to take action is hampered by socio-economic factors such as high unemployment rates among the youth and high standards of living (as this provides the necessary financial resources to purchase sustainable clothing or make environmentally friendly eating choices). Older individuals, who may have the resources available, might not have high environmental self-efficacy, as their belief in making meaningful change is overshadowed by the idea that they will not be around for much longer. As individuals get older, a decline in attempts to make meaningful change is exhibited, as the younger generation are the future and have more motivation to rectify issues for their own futures (Pillemer et al., 2022). For those younger than 25, they lack the opportunities for environmental mastery experiences, which is a result of not having the adequate resources to make meaningful change. Therefore, their confidence in their ability to make sustainable choices and changes is rooted in vicarious experiences that they engage with on social media, from the news, or even in educational textbooks (Mugambiwa & Dzomonda, 2018). Observing these idealised behaviours may inadvertently increase young adults' perceived environmental self-efficacy, but they are met with the reality of unemployment, unequal access to resources, and dealing with other socio-cultural concerns, which diminishes confidence in their ability to make a change.

The independent samples t-test for geographic location, that is those residing in a rural or urban area, and environmental self-efficacy revealed no statistically significant difference. As there is no previous research done on environmental self-efficacy and geographic location, specifically looking at rural and urban areas, the current findings of the study do not have any reference point to the results of other studies to make comparisons. However, the first reason that no significant difference was found between those residing in urban and rural areas could be attributed to the sample size difference for each geographic location group. The big difference between rural ($n = 19$) and urban ($n = 199$) could have resulted in constrained statistical power to explain the difference in environmental self-efficacy between the two groups. Additionally, the study was conducted at the University of the Witwatersrand, with university students, in an urban area. Those who have their permanent residence located in the rural area, but have now moved to the urban area for university, may have perceived that their environmental self-efficacy was higher as they had more available resources and access to opportunities to engage in sustainable behaviours (Debies-Carl & Huggins, 2009).

Applying SCT to the non-significant differences between rural and urban areas, reciprocal determinism may offer insight into why this finding was produced. Those living in urban areas may perceive their environmental self-efficacy to be higher as they live in environments that have recycling facilities or sustainability campaigns that encourage green behaviour. Contrarily, those living in rural areas live in environments where they are connected with nature as they engage in farming, and rainwater collection and harvesting for example (Sun et al., 2024). Their perceived environmental self-efficacy is also high as they engage with green behaviours as a means of survival, gaining the necessary mastery experiences to instil higher confidence to make a change. However, both rural and urban areas face their own set of barriers. These include, for example, and are not limited to, a lack of government initiatives (TEAP, 2023), no access to transport that does not produce carbon emissions, and the high prices of green consumerism, which result in there being no significant differences in environmental self-efficacy.

5.6 Limitations of the study

The study, although with contrary findings to the literature, did produce findings that contribute to the growing body of literature on eco-anxiety. As with most research studies, it is important to acknowledge that the research is not without flaws. Therefore, the following section will outline some of the limitations.

The first limitation, which was a challenge that arose throughout the study in terms of data analysis, was the sample size. Although the Central Limit Theorem supported normal distribution ($N = 218 > 30$), for techniques such as CFA and EFA the findings needed to be interpreted with caution as ideal sample sizes for these techniques are samples of 300 or more responses to have good to excellent robust results (Kyriazos, 2018). Furthermore, with a sample of 218 participants, the sample can be considered relatively small in relation to being representative of the South African population of young adults. This relatively smaller sample is a limitation as the findings are less suitable for making generalisations, as the results from the statistical analyses and interpretations for larger sample sizes hold more power (Anderson et al., 2017). This presents itself as a limitation, as this sample size difference can result in unstable factor solutions and errors arising (Lingard & Rowlinson, 2006). The volunteer-nature of research participation is a limitation that may cause indirect biases to arise such as self-

selection bias (Laher & Botha, 2012), as the young adults of the sample who participated in this study would be automatically differentiated from those who did not participate in the study.

In terms of generalisability, the use of a student sample presents another limitation. Student populations tend to be the most common form of sample in psychological studies (Hanel & Vione, 2016). The study's aim was to investigate the relationship between eco-anxiety and environmental self-efficacy in young adults, however, the university sample of young adults cannot be generalised to all young adults as student samples tend to have more homogenous attitudes (Peterson & Merunka, 2014). Young adults who are not in university may have different levels of knowledge and awareness on environmental issues. Additionally, as pro-environmental behaviours are favoured behaviours by society, especially in a university setting that aims to uphold a certain image, individuals may have responded in a socially desirable manner. This may have introduced social desirability bias (van de Mortel, 2008). Although this was an anonymous survey, young adults tend to want to make themselves look good in terms of fitting in with desired behaviours. The result of this is that students could have over-reported toward the higher ends of the scale of the ESE-20.

Another limitation is the design of the study, being correlational in nature. This means that the research cannot explain why relationships do not exist between the variables, relying only on the association between the variables. Additionally, the cross-sectional and non-experimental research design did not allow for causality to be established, and the researcher was unable to delve deeper into the reasoning for choices in the questionnaire through probing questions (Kramer et al., 2019). Furthermore, the cross-sectional research only provides a 'snapshot' (Wang & Cheng, 2020) of eco-anxiety and environmental self-efficacy, which does not show how these may have evolved as one would note with longitudinal research. Moreover, there is very limited research that addresses the concept of eco-anxiety specifically, without referring to it as climate anxiety, and even less research is available that focuses specifically on eco-anxiety linked to environmental self-efficacy.

As a result of this, drawing a definitive conclusion became difficult in terms of interpretation and evaluation of the findings. The current research did validate the EAQ-22 and ESE-20 scales for use in the South African context, however, it is worth noting that these tools were developed in Western, Educated, Industrialised, Rich, and Democratic (WEIRD) settings (Muthukrishna et al., 2020). In places such as Switzerland and Hungary where these scales were developed,

may have less stigma and greater acknowledgement and acceptance of anxiety disorders. Therefore, as South Africa still carries some stigma toward mental health disorders (Monnapula-Mazabane & Petersen, 2023), these tools may not have captured the unique experiences of eco-anxiety and environmental self-efficacy within the local setting. Therefore, these measuring tools may not have captured the unique experiences of eco-anxiety and environmental self-efficacy within the local setting. This limitation highlights the need for developing frameworks that can enhance research of these constructs in the broader academic discourse, but also an individual's understanding of these constructs in South Africa.

5.7 Recommendations for future research

The current research, although one of few globally and possibly the first in the South African literature, has outlined the relationship that exists between eco-anxiety and environmental self-efficacy. The literature review and the findings of this study have indicated that eco-anxiety is a concept that has recently garnered attention, with many people unfamiliar with the concept and with most research focusing on trying to conceptualise a working definition for this concept. That said, there are many possible avenues for future research.

Firstly, for future research, a larger and more diverse sample would be beneficial to improve the generalizability and robustness of the findings on eco-anxiety and environmental self-efficacy amongst young adults. The current study sample, although diverse in terms of demographic factors, was from a relatively homogenous sample population of students from a single university institution, an environment that encourages similar attitudes and ways of thinking (Peterson & Merunka, 2014). A large-scale study with students from universities across South Africa would provide perspectives of those young adults living in different geographic locations, where exposure to climate and ecological change might be higher. It would be valuable to also conduct research on young adults who are not in university settings, especially those with greater access to natural spaces such as the beach, mountainous and forest regions, or botanical parks. This would bring an understanding of whether these young adults who frequent these natural spaces, develop deeper connections to nature in comparison to the young adults of the current study who were in a more built-up and urbanised environment. This avenue of research would help identify how physical environments can influence an individual's awareness, perceptions, and agency toward environmental issues, thus possibly influencing eco-anxiety better. Additionally, in line with alternative samples for future research,

it would be useful to explore how eco-anxiety manifests in rural settings. Those living in rural areas have their own experiences with eco-anxiety and environmental self-efficacy, considering that they depend on the environment for their livelihoods. Factors such as sustenance farming, rainfall collection for daily use, and experiencing drought more harshly and frequently than those in urban cities; may shape eco-anxiety and environmental self-efficacy a lot differently.

A second avenue would be that research explores how the organisational aspect, whether this is organisational well-being or organisational green-initiatives, impacts eco-anxiety and environmental self-efficacy. This would allow for research to understand the possible transition from being in a homogenous context such as a university, to more heterogeneous settings with different age groups, different cognitive levels, and how salary influences these constructs. One avenue of exploration includes looking at employees working for organisations with strong corporate social responsibility (CSR) green initiatives (Alam & Islam, 2021). Future research could assess whether green organisational cultures and policies help in buffering an individual's eco-anxiety, or even contrarily how being exposed to this in one's workplace might heighten the level of anxiety they feel toward environmental issues. This could be explored in terms of investigating how their organisation might be contributing to the environmental crises, or combating it, and how this may impact an individual's job satisfaction, morale, and well-being.

Thirdly, as discussed in the aforementioned limitations, a qualitative approach to conducting research on these concepts, rather than a quantitative one, would offer a richer and more nuanced understanding of eco-anxiety. In a country like South Africa, where many are unfamiliar or not as knowledgeable on the concept of anxiety as a whole (Selormey et al., 2019), unpacking eco-anxiety through in-depth interviews, focus groups or narrative storytelling could help explore an individual's experiences, feelings, and methods of coping a lot better than the quantitative approach did. Acquiring knowledge on eco-anxiety through these qualitative approaches could also help in mitigating the issue of response fatigue, as the EAQ-22 and ESE-20 are lengthy questionnaires that aim to explore the multifaceted dimensions of these constructs. Furthermore, as the study also explored the other sociocultural and economic concerns of young adults, future research could unpack why these broader contextual concerns (such as personal, religious, and safety concerns) are prioritised over environmental issues through qualitative open-ended questions. In terms of the research approach, whether this is a quantitative or qualitative approach, investigating eco-anxiety in relation to other forms of psychological capital such as resilience, hope, or optimism (Luthans & Youssef-Morgan, 2017),

may be an avenue that could provide insights to understanding whether these buffer or exacerbate eco-anxiety.

Lastly, future research should take the route of longitudinal research in exploring these constructs. The time frame of the current research study only allowed for cross-sectional research to be conducted. Environmental self-efficacy and eco-anxiety would be something that may not appear immediately, but rather after exposure to a certain event, whether this be directly or indirectly. As the current research has highlighted, environmental issues are one of South African young adult's least important issues of concern. Therefore, with longitudinal research, researchers can implement various interventions that could assess participants' awareness and agency toward these issues over different times and assess whether eco-anxiety increases or decreases over the research period.

5.8 Implications of the research

The findings of the study may not entirely be consistent with what the existing literature discusses in relation to these constructs or similar ones, such as climate anxiety, pro-environmental behaviours, and green-efficacy, however, it does provide some theoretical and practical implications for the field of environmental psychology.

In terms of theoretical implications, the results contribute to the growing discourse on eco-anxiety and climate change. Parreira and Mouro (2023) and Pihkala (2020) distinguished between action-oriented (practical) or passive emotional responses to eco-anxiety. The results have supported the stance that eco-anxiety in the South African context is more of a passive emotional response as a result of prioritising immediate socio-economic concerns that require more action-oriented responses. Spence et al.'s (2012) concept of psychological distance plays a significant role in the South African context. Young adults perceive climate and environmental change as issues that urgently require attention, however, these are distant compared to the already existing socio-cultural and economic challenges (De Wet-Billings, 2023; McDonald et al., 2015). Furthermore, this research was one of the first to explore the relationship between eco-anxiety and environmental self-efficacy in the Global South, while also being the first to use the EAQ-22 and ESE-20 in South Africa. The theoretical implications of this are that the findings extend the pool of literature that predominantly revolves around WEIRD narratives (Muthukrishna et al., 2020), by examining how young South Africans

experience and respond to eco-anxiety through self-efficacy. Not only did this study investigate the relationship between these two constructs, but it also additionally examined how the sociocultural and economic concerns may have influenced this relationship. Altogether, this has helped contribute to the knowledge economy by including Global South perspectives to help challenge the Western-centric discourse.

From a practical perspective, the findings can help with creating interventions that help young adults manage their heightened levels of habitual worry. This serves as a starting point to help with implementing mental health initiatives that will begin to recognise eco-anxiety as a growing psychological concern in South Africa and integrate this into mental health awareness and educational programmes (Brophy et al., 2023). These initiatives can help young adults develop coping strategies that address both eco-anxiety while simultaneously accounting for the socio-cultural and economic anxieties, preventing maladaptive distress that results in the negative consequences of eco-anxiety (Crandon et al., 2024; Naguy et al., 2020). Furthermore, as the study focussed on university students, the findings can help universities integrate environmental psychology into coursework, as well as enhance on-campus mental health resources to help educate students and staff. Additionally, the research highlights that eco-anxiety interventions, whether this is at universities, in communities, or at the government level, needs to be done as a collaborative process to understand all the concerns the youth are faced with, as well as how much agency and control they actually have to implement sustainable behaviours to achieve positive change.

5.9 Conclusion

In conclusion, the overall study has provided a holistic overview of the constructs of eco-anxiety and environmental self-efficacy and how these are influenced by the socio-economic factors of South Africa. The results revealed that no relationship was found between eco-anxiety and environmental self-efficacy, as well as no significant differences between gender, age, and geographic location groups in terms of their eco-anxiety and environmental self-efficacy scores. Although the findings are contradictory to what was initially hypothesised, the research study has added some valuable insight to the growing discourse on eco-anxiety, with a core focus on the unique socio-economic challenges endured by the youth in South Africa.

The study did, however, provide future researchers with measuring instruments that can be utilised for further investigation into these constructs. The EAQ-22 and the ESE-20 were, to the researcher's knowledge, utilised for the first time in the South African context. Thus, Confirmatory Factor Analyses (CFA) were conducted for both scales and Exploratory Factor Analysis (EFA) for the ESE-20 to assess a better structure. These scales were both tested and proven for their reliability and structural validity in the South African context, which can be utilised for future research studies.

As with all studies, there were limitations that needed to be acknowledged in this study. These included the sample's demographic representation being relatively unequal, the nature of the study being cross-sectional, the use of a student sample, as well as the lengthy nature of the survey. Studies carried out in the future on these variables can address the limitations by making use of the recommendations, to delve deeper into the construct of eco-anxiety in the South African context. This study has emphasised the need for more interventions to be put in place to raise awareness, increase knowledge on, and support individuals dealing with environmental issues in the local context.

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Appendices

Appendix A: Demographic Questionnaire

1. Please indicate your age

- ☐ 18 years old
- ☐ 19 years old
- ☐ 20 years old
- ☐ 21 years old
- ☐ 22 years old
- ☐ 23 years old
- ☐ 24 years old
- ☐ 25 years old
- ☐ Older than 25

2. Please indicate your gender

- ☐ Female
- ☐ Male
- ☐ Other, please specify _____
- ☐ Prefer not to say

3. Please indicate your race

- ☐ Black
- ☐ White
- ☐ Coloured
- ☐ Indian
- ☐ Asian
- ☐ Other, please specify _____
- ☐ Prefer not to say

4. Please indicate what high school you attended, and the area it was located in:

5. Please indicate your level of education

- ☐ Matric (grade 12)
- ☐ Undergraduate degree
- ☐ Honours degree
- ☐ Master's degree

☐ Other (Diploma, higher certificate, etc.)

6. Please indicate whether or not you are employed

☐ Yes

☐ No

6.1. If you are employed, please indicate employment type

☐ Full-time

☐ Part-time

☐ Occasional

7. Please indicate what area your permanent home residence is located in

☐ Urban area

☐ Sub-urban area

☐ Township

☐ Rural

8. Please rate the following items in order of current importance to you, that is rate the items from 1-10 in order of what you believe is currently most important to least important to you

☐ International tensions (e.g. War)

☐ Social concerns (e.g. Poverty, gender-based violence, and inequity)

☐ Environmental concerns (e.g. Global warming, ecological disasters)

☐ Personal issues (e.g. Academics, identity, family)

☐ Economic concerns (e.g. Post-graduate employment, cost of living)

☐ Health concerns (e.g. Cancer, HIV/AIDS, COVID-19)

☐ Religious concerns (e.g. Prayer, sinning, inter-faith conflicts)

☐ Political concerns (e.g. Xenophobia, load-shedding, corruption)

☐ Personal safety issues (e.g. crime, violence, cyberbullying)

☐ Technological concerns (e.g. cybersecurity)

Appendix B: Eco-anxiety Questionnaire (EAQ-22)

Item no.	Statement	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
1	It really upsets me to see how animals are suffering because of environmental pollution.	1	2	3	4

2	I worry about the next generation because they will be drastically affected by climate change.	1	2	3	4
3	I am so anxious about climate change that I cry	1	2	3	4
4	It makes me angry that many people fail to do even the most basic things to protect the environment.	1	2	3	4
5	I have unusual tension in my muscles since I've become more aware of climate change	1	2	3	4
6	I feel sorry for those whose health is already negatively affected by climate change.	1	2	3	4
7	I am terrified by how many things have changed in just a few years because of climate change	1	2	3	4
8	My loved ones become irritated because I talk about my climate change concerns too often	1	2	3	4
9	I am worried about the increasing number of natural disasters caused by climate change.	1	2	3	4
10	Thoughts of climate change often distract me from my current tasks.	1	2	3	4
11	It makes me sick to think about how much certain countries are polluting the environment, and there is nothing I can do about it.	1	2	3	4
12	It scares me that the weather is becoming more and more unpredictable because of climate change	1	2	3	4
13	I am so anxious about climate change that it affects my performance at school/work.	1	2	3	4
14	It is frustrating that we elect decision makers who do not seriously consider the work of climate scientists/experts.	1	2	3	4
15	I feel uneasy when I think about the consequences of climate change.	1	2	3	4
16	People look at me in a strange way because I am so passionate about environmental action.	1	2	3	4

17	I find it terrifying that the seasons have changed a lot in a short time.	1	2	3	4
18	I worry that every decision I make will result in something harmful to the environment.	1	2	3	4
19	It makes me angry that our environmentally damaging behaviours increase the suffering of people who live in areas that are more impacted by climate change.	1	2	3	4
20	I have a very negative perspective on the future of the planet because of climate change.	1	2	3	4
21	I am constantly on alert because there could be a climate change related disaster at any time.	1	2	3	4
22	I sleep poorly because I keep thinking about climate change.	1	2	3	4

Appendix C: Environmental Self-Efficacy Scale (ESE-20)

Item No.	Statement	No certainty at all	Minimal certainty	Very low certainty	Low certainty	Moderate-low certainty	Moderately certainty	Moderate –high certainty	High certainty	Very high certainty	Almost certain	Completely certain
1.	I can control my impact on the environment	0	1	2	3	4	5	6	7	8	9	10
2.	I can help mitigate environmental problems in my community if they arise	0	1	2	3	4	5	6	7	8	9	10
3.	I can find several ways to be part of the solution when I am introduced to an environmental problem	0	1	2	3	4	5	6	7	8	9	10
4.	I can reduce the environmental	0	1	2	3	4	5	6	7	8	9	10

	problems that the next generation will need to face in the future											
5.	I can have a significant positive impact on the environment	0	1	2	3	4	5	6	7	8	9	10
6.	I can be as environmentally friendly as most people in my community	0	1	2	3	4	5	6	7	8	9	10
7.	I can avoid being among the least environmentally friendly members of my community	0	1	2	3	4	5	6	7	8	9	10
8.	I can choose forms of transportation that cause fewer carbon emissions	0	1	2	3	4	5	6	7	8	9	10
9.	I can help preserve the quality of the water	0	1	2	3	4	5	6	7	8	9	10
10.	I can choose to be an environmentally friendly consumer	0	1	2	3	4	5	6	7	8	9	10
11	I can reduce the negative impact I have on the planet	0	1	2	3	4	5	6	7	8	9	10
12	I can support environmental policy through political activism	0	1	2	3	4	5	6	7	8	9	10
13	I can do my part in solving the world's environmental problems	0	1	2	3	4	5	6	7	8	9	10
14	I can be environmentally friendly even when the people	0	1	2	3	4	5	6	7	8	9	10

	with whom I have close relationships are not											
15	I can continue being environmentally friendly even when faced with financial burdens	0	1	2	3	4	5	6	7	8	9	10
16	I can continue being environmentally friendly even when I'm having a bad day	0	1	2	3	4	5	6	7	8	9	10
17	I can make environmentally eating choices	0	1	2	3	4	5	6	7	8	9	10
18	I can set an example of environmentally friendly behaviour, for others to follow	0	1	2	3	4	5	6	7	8	9	10
19	I can learn more about new environmental issues as they become	0	1	2	3	4	5	6	7	8	9	10
20	I can continue to take steps towards solving large environmental problems, even when others are overwhelmed by the scale of these problems	0	1	2	3	4	5	6	7	8	9	10

Appendix D: Ethics Clearance Certificate



SCHOOL OF HUMAN AND COMMUNITY DEVELOPMENT ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: MAORG-24-03

PROJECT TITLE:

Green-minded fear: Addressing Eco-anxiety through Environmental Self-efficacy.

INVESTIGATOR

Korja Tyler

SCHOOL/DEPARTMENT OF INVESTIGATOR

SHCD/Psychology

DATE CONSIDERED

08 July 2024

DECISION OF THE COMMITTEE

Approved unconditionally

RISK LEVEL

Low Risk

EXPIRY DATE

31 December 2026

ISSUE DATE OF CERTIFICATE

23 July 2024

CHAIRPERSON

Aline Ferreira Correia
(Prof. Aline Ferreira Correia)

cc: Prof. Andrew Thatcher (Supervisor)

DECLARATION OF INVESTIGATOR

To be completed in duplicate and ONE COPY returned to the Chairperson of the School/Department ethics committee.

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure as approved, I/we undertake to submit an amendment of the protocol to the Committee.


Signature

Date

26 / 07 / 2024

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix E: Access Letter for Wits Students emailed to the Registrar.



Psychology
School of Human & Community
Development
University of the Witwatersrand
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax: 011 717 4559



Good day

My name is Tyler Kortje, an Organisational Psychology Masters student at the University of the Witwatersrand. I am writing this to request permission to access students at the University of the Witwatersrand in order to carry out my research. The aim of my research is to investigate the extent to which eco-anxiety is considered an issue of relevance to young adults in the South African context, and how self-efficacy impacts on an individual's levels of eco-anxiety.

For students to participate, it would require them to complete an online questionnaire which will be distributed through an electronic link on REDCap sent to their student email addresses with a Participant Information Sheet. In accessing this link, no IP addresses will be recorded, and in no way will their student emails be linked to any of the results. Completion of the questionnaires will take less than 30 minutes. Participation in my study is completely voluntary, with no disadvantages whatsoever posed to students if they do not participate or no longer wish to participate in the study. There are no foreseeable risks or benefits with participation in the study. The student will have the right to withdraw from the study at any point up until they submit their response. Only grouped data will be reported and therefore responses will be both anonymous and confidential. If the participant requests for the research findings, these will be summarised and sent directly to the participant.

I have attached the Ethics Clearance Certificate (Protocol number: MA0RG-24-03), the letter of approval from the readers, Form A for student research, and the Questionnaires for the survey.

Kind regards,

Tyler Kortje
1842704@students.wits.ac.za
071 865 2414

Professor Andrew Thatcher (Supervisor)
Andrew.thatcher@wits.ac.za
011 717 4533

Appendix F: Form A - Request to conduct Research at the University of the Witwatersrand

FORM A - Request to conduct Research at the University of the Witwatersrand, JHB

This form is to be completed by registered Honours/Master by Research/ PhD students and staff at Wits wishing to conduct research by using Wits student/staff data. Please email this form with your supporting documents to Research.Deputy-Registrar@wits.ac.za

First Name

Surname:

Tyler

Kortje

Staff/Student number:

Student Number:

1842704

Degree currently registered:

School:

MA Organisational Psychology (by CW & RR)

Community and Development

Research title: Green-minded Fear: Addressing Eco-anxiety through Environmental Self-efficacy

Has ethics clearance been obtained from the University Ethics Committee/School Ethics Committee?

YES

NO ✓

(If yes, please include a copy of the ethics clearance certificate and protocol number below)

Protocol number:

MAORG-24-03

PLEASE NOTE: If an unconditionally approved ethics clearance certificate has not been obtained, you will not be granted permission to conduct your research.

Has your Head of Department/Supervisor granted permission for the research to be conducted?

YES

NO

(If yes please include a copy of the letter of approval)

What is the expected duration of your research and on which date do you intend submitting the research?

Research report to be submitted by 15 February 2025

Whom is the research and/or questionnaire being conducted on?

Students

✓

Staff

(Please tick the appropriate box)

If the research will be conducted on student data, please specify year of study /Faculty or degree data will be required for:

First Year Students	✓
Second Year Students	✓
Third Year Students	✓
Final Year Students	✓
Postgraduate Students	✓
Faculty	All
Degree	All

Section A:

How will the research be conducted?

E-Mail (please indicate if school administrators will be assisting in circulating the emails)	The research will be conducted through surveys via online questionnaire instruments, which will be disseminated by means of the University's student email communication systems, and will contain the demographics questionnaire, the Eco-anxiety Questionnaire (EAQ-22) and the Environmental Self-Efficacy Scale (ESE-20) for participants to complete within a time period of 20 minutes or less
Interviews (please attach a copy of the interview questions)	n/a
Other data collection (please specify lists or statistics)	n/a
Focus Groups	n/a
Venues (If using a venue for your research, please indicate venue name and ensure arrangements have been made with the venue manager)	n/a

Section B:

This section only needs to be completed for the circulation of questionnaires, surveys etc. by the University Registrar's Office:

Please provide the link for your questionnaire and attach a copy of the questionnaire (the link will be emailed to students in order	https://redcap.core.wits.ac.za/redcap/surveys/?s=RNC7N87CNJPWX8DY
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for them to complete the questionnaire)	
Please provide us with a brief message that will accompany your questionnaire. This message will be sent as an e-mail to students requesting them to complete the questionnaire.	Good day, My name is Tyler Kortje, and I am a Master's student in Organisational Psychology at the University of the Witwatersrand. I am currently conducting research on the impact of self-efficacy on eco-anxiety levels among young adults studying at university. I invite you to contribute to this research by completing a questionnaire, which will take less than 20 minutes to complete. Your insights would be invaluable to this study. Please click on the link below to access the questionnaire: https://redcap.core.wits.ac.za/redcap/surveys/?s=RNC7N87CNJPWX8DY Thank you in advance for your participation and valuable contribution to this research. Best regards, Tyler Kortje Email: 1842704@students.wits.ac.za Professor Andrew Thatcher (Supervisor) Email: andrew.thatcher@wits.ac.za

NOTE: If using REDCAP, circulation may take place with departmental administrators within your school. You need to make the necessary arrangements with the administrator.

However, if your department/school does not use REDCAP, then complete the section above.

Student signature:



Date: 10 May 2024

Appendix G: Email distributed to students

Good day,

My name is Tyler Kortje, and I am a Master's student in Organisational Psychology at the University of the Witwatersrand. I am currently conducting research on the impact of self-efficacy on eco-anxiety levels among young adults studying at university.

I invite you to contribute to this research by completing a questionnaire, which will take less than 20 minutes to complete. Your insights would be invaluable to this study. Please click on the link below to access the questionnaire:

<https://redcap.core.wits.ac.za/redcap/surveys/?s=RNC7N87CNJPWX8DY>

Thank you in advance for your participation and valuable contribution to this research.

Best regards,

Tyler Kortje

Email: 1842704@students.wits.ac.za

Professor Andrew Thatcher (Supervisor)

Email: andrew.thatcher@wits.ac.za

Appendix H: Participant Information Sheet

Dear Participant

My name is Tyler Kortje, and I am an Organisational Psychology Masters student at the University of the Witwatersrand. I am conducting research to investigate the extent to which eco-anxiety is considered an issue of relevance to young adults in the South African context, and how self-efficacy impacts on an individual's levels of eco-anxiety. I would like to invite you to participate in this study. Your contributions can help inform policies and shape future mental health interventions to raise awareness of environmental issues and their impacts on psychological health.

Participation in this study will require you to complete an online questionnaire, which will include demographic questions, questions on eco-anxiety and questions on environmental self-efficacy. This will take less than 20 minutes to complete. The survey will consist of three sections, namely a demographics sections, a section to evaluate your eco-anxiety and lastly a section to assess environmental self-efficacy. Once you begin the survey, there will be a checkbox that you need to tick to acknowledge that you have read and understood this information, and for you to agree on your participation.

Your participation in the study is completely voluntary, and there are no risks associated with your participation. You have the right to not answer questions you feel uncomfortable

answering, and should you wish to no longer participate in the study, you have the right to withdraw up until the point that you submit your questionnaire... Your responses will remain confidential and anonymous throughout, and no identifying information such as your name will be recorded at any point of the study. Only grouped data will be reported and therefore responses will be both anonymous and confidential. Responses collected will only be seen by my supervisor and myself (contact information provided at the end of this invite) and will be securely stored on a password-protected device.

If you do wish to receive a summary of the findings from this research, it can be provided on request. If this is something you would like to receive, there will be a section not linked to your responses, to maintain your confidentiality, to provide an email address for these results to be sent to you. The research will only be utilized for academic purposes; however, it will be placed in the online repository of the university (WIReDSpace) and may be used for future conferences or publication. If you have found any of the topics discussed distressing, support is available free of charge at the Emthonjeni Centre on East Campus at the University of the Witwatersrand. To book a free consultation with a psychologist, please contact Ms Paballo Lepota (Administrator) on +27 (11) 717 4513 or via email on paballo.lepota@wits.ac.za. Furthermore, if you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za. Your participation is greatly appreciated and will contribute to an ever-growing body research on this topic.

Kind Regards,

Tyler Kortje
1842704@students.wits.ac.za

Professor Andrew Thatcher (Supervisor)
Andrew.thatcher@wits.ac.za



CALL FOR RESEARCH PARTICIPANTS

For the study: Green-minded fear: Addressing eco-anxiety through environmental self-efficacy

We are inviting volunteers that are:

- Aged 18 -25
- **WITS Students**, from any Faculty
- Willing to complete an anonymous online survey

To participate in this study, an anonymous survey can be completed by

- **Accessing the following link:**
<https://redcap.core.wits.ac.za/redcap/surveys/?s=RNC7N87CNJPWX8DY>
- **Scanning the attached QR code**



Researcher: Tyler Kortje
(1842704@students.wits.ac.za)

Supervisor: Professor Andrew Thatcher
(andrew.thatcher@wits.ac.za)



For completion of a Masters in Organisational Psychology

Appendix J: Figures of Results Chapter

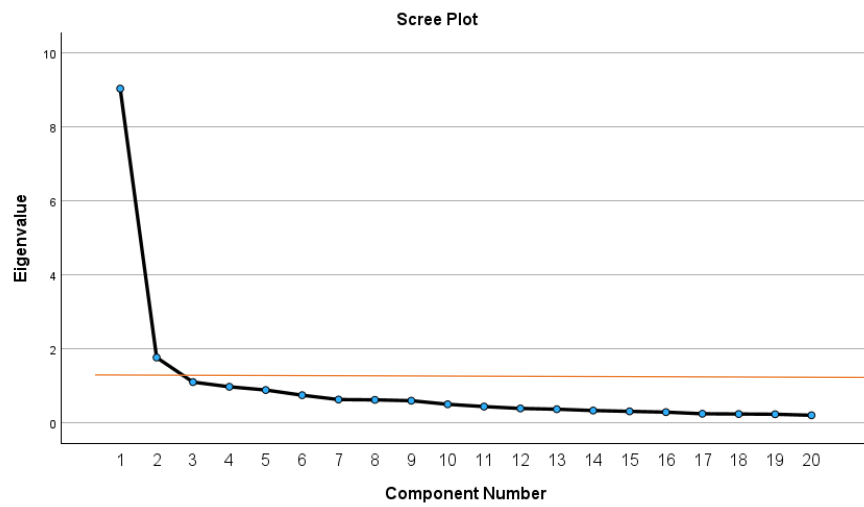


Figure 3: Scree Plot for ESE

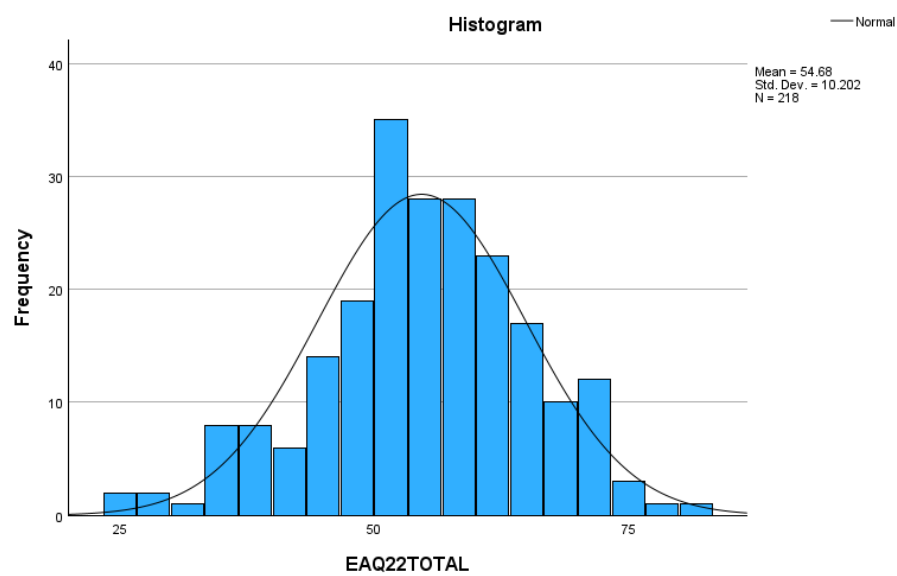


Figure 4: EAQ-22 Frequency Histogram

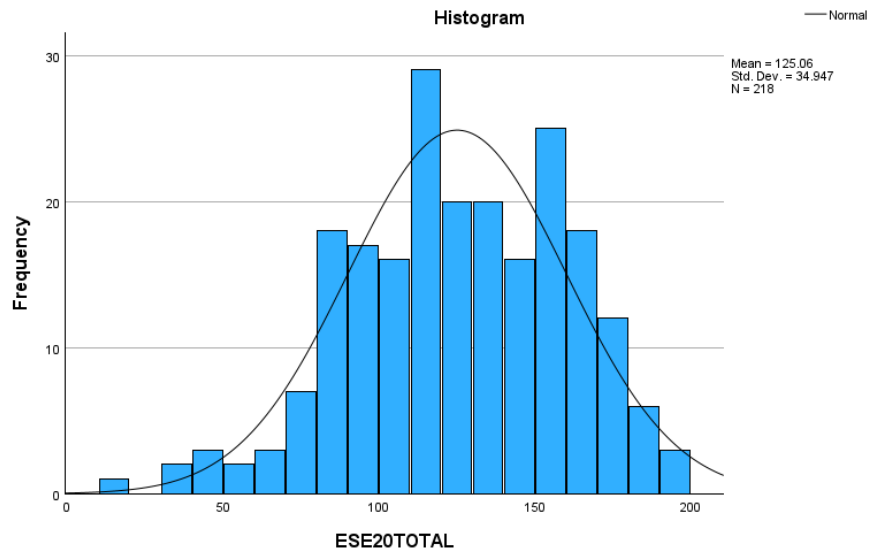


Figure 5: ESE-20 Frequency Histogram

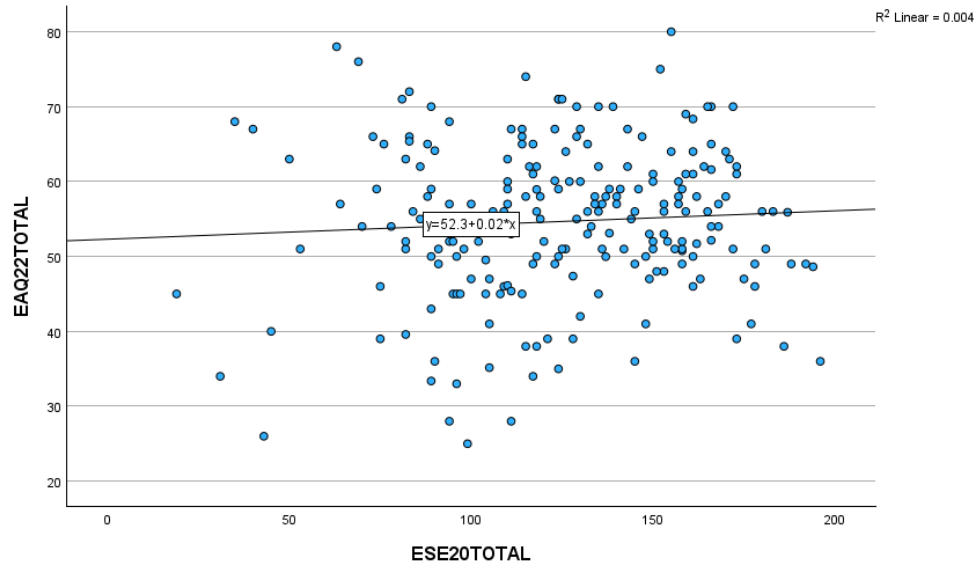


Figure 6: Linearity Scatterplot for EAQ-22 and ESE-20

Appendix K: Additional Results Analysis Tables

Table 4.4A: Correlation Matrix for the ESE-20

	Mean	Std Dev	ESE1	ESE2	ESE3	ESE4	ESE5	ESE6	ESE7	ESE8	ESE9	ESE10	ESE11	ESE12	ESE13	ESE14	ESE15	ESE16	ESE17	ESE18	ESE19	ESE20
ESE1	6,6	2,6	1,00																			
ESE2	5,0	2,5	0,46	1,00																		
ESE3	5,7	2,4	0,42	0,60	1,00																	
ESE4	4,6	2,6	0,35	0,54	0,53	1,00																
ESE5	5,8	2,7	0,54	0,50	0,49	0,59	1,00															
ESE6	7,0	2,4	0,54	0,32	0,41	0,30	0,55	1,00														
ESE7	7,2	2,6	0,41	0,25	0,39	0,22	0,32	0,51	1,00													
ESE8	4,4	3,0	0,26	0,37	0,32	0,28	0,30	0,26	0,26	1,00												
ESE9	5,6	3,0	0,39	0,39	0,31	0,43	0,51	0,33	0,21	0,48	1,00											
ESE10	7,5	2,4	0,56	0,29	0,46	0,32	0,47	0,53	0,37	0,27	0,40	1,00										
ESE11	6,8	2,6	0,61	0,44	0,46	0,45	0,55	0,50	0,42	0,32	0,50	0,64	1,00									
ESE12	5,1	2,9	0,35	0,35	0,36	0,40	0,37	0,34	0,22	0,30	0,33	0,30	0,38	1,00								
ESE13	6,2	2,7	0,41	0,34	0,38	0,42	0,54	0,41	0,29	0,28	0,34	0,50	0,57	0,49	1,00							
ESE14	7,4	2,4	0,50	0,26	0,43	0,23	0,42	0,58	0,44	0,25	0,33	0,56	0,55	0,45	0,56	1,00						
ESE15	5,8	3,0	0,35	0,28	0,33	0,25	0,42	0,40	0,35	0,35	0,37	0,51	0,46	0,32	0,55	0,54	1,00					
ESE16	7,2	2,6	0,48	0,18	0,39	0,16	0,35	0,53	0,41	0,21	0,32	0,59	0,48	0,31	0,48	0,70	0,55	1,00				
ESE17	6,3	2,7	0,23	0,21	0,28	0,18	0,25	0,35	0,36	0,34	0,29	0,44	0,31	0,26	0,37	0,33	0,42	0,45	1,00			
ESE18	7,0	2,4	0,48	0,31	0,44	0,34	0,45	0,56	0,39	0,31	0,40	0,67	0,59	0,42	0,60	0,63	0,57	0,68	0,55	1,00		
ESE19	7,5	2,4	0,39	0,22	0,46	0,31	0,41	0,50	0,41	0,25	0,29	0,62	0,48	0,41	0,53	0,60	0,45	0,66	0,44	0,66	1,00	
ESE20	6,1	2,7	0,33	0,35	0,52	0,51	0,50	0,43	0,32	0,35	0,38	0,51	0,43	0,40	0,49	0,48	0,48	0,53	0,41	0,55	0,64	1,00

Table 4.5.2A: Item total statistics for Eco-Anxiety Questionnaire

Item no.	EAQ-22 items	Scale Mean if item deleted	Cronbach's Alpha if the item deleted
1	It really upsets me to see how animals are suffering because of environmental pollution.	51.33	0.90
2	I worry about the next generation because they will be drastically affected by climate change.	51.31	0.90
3	I am so anxious about climate change that I cry	52.95	0.90
4	It makes me angry that many people fail to do even the most basic things to protect the environment.	51.46	0.89
5	I have unusual tension in my muscles since I've become more aware of climate change	53.01	0.89
6	I feel sorry for those whose health is already negatively affected by climate change.	51.32	0.90
7	I am terrified by how many things have changed in just a few years because of climate change	51.59	0.89
8	My loved ones become irritated because I talk about my climate change concerns too often	53.08	0.90
9	I am worried about the increasing number of natural disasters caused by climate change.	51.67	0.89
10	Thoughts of climate change often distract me from my current tasks.	53.10	0.89
11	It makes me sick to think about how much certain countries are polluting the environment, and there is nothing I can do about it.	51.87	0.89
12	It scares me that the weather is becoming more and more unpredictable because of climate change	51.57	0.89

13	I am so anxious about climate change that it affects my performance at school/work.	53.32	0.90
14	It is frustrating that we elect decision makers who do not seriously consider the work of climate scientists/experts	51.52	0.90
15	I feel uneasy when I think about the consequences of climate change.	51.80	0.89
16	People look at me in a strange way because I am so passionate about environmental action.	53.13	0.89
17	I find it terrifying that the seasons have changed a lot in a short time.	51.87	0.89
18	I worry that every decision I make will result in something harmful to the environment.	52.63	0.89
19	It makes me angry that our environmentally damaging behaviours increase the suffering of people who live in areas that are more impacted by climate change.	51.74	0.89
20	I have a very negative perspective on the future of the planet because of climate change.	52.16	0.90
21	I am constantly on alert because there could be a climate change related disaster at any time.	52.74	0.90
22	I sleep poorly because I keep thinking about climate change.	53.40	0.90

Table 4.5.3A: Item total statistics for Environmental Self-Efficacy Scale

Item no.	ESE-20 items	Scale Mean if item deleted	Cronbach's Alpha if the item deleted
1	I can control my impact on the environment	118.45	0.93
2	I can help mitigate environmental problems in my community if they arise	120.07	0.93
3	I can find several ways to be part of the solution when I am introduced to an environmental problem	119.35	0.93
4	I can reduce the environmental problems that the next generation will need to face in the future	120.43	0.93
5	I can have a significant positive impact on the environment	119.21	0.93
6	I can be as environmentally friendly as most people in my community	118.11	0.93
7	I can avoid being among the least environmentally friendly members of my community	117.82	0.93
8	I can choose forms of transportation that cause fewer carbon emissions	120.66	0.93
9	I can help preserve the quality of the water	119.49	0.93
10	I can choose to be an environmentally friendly consumer	117.53	0.93
11	I can reduce the negative impact I have on the planet	118.24	0.93
12	I can support environmental policy through political activism	119.91	0.93
13	I can do my part in solving the world's environmental problems	118.83	0.93
14	I can be environmentally friendly even when the people with whom I have close relationships are not	117.67	0.93
15	I can continue being environmentally friendly even when faced with financial burdens	119.28	0.93
16	I can continue being environmentally friendly even when I'm having a bad day	117.83	0.93
17	I can make environmentally eating choices	118.78	0.93
18	I can set an example of environmentally friendly behaviour, for others to follow	118.03	0.93
19	I can learn more about new environmental issues as they become	117.54	0.93
20	I can continue to take steps towards solving large environmental problems, even when others are overwhelmed by the scale of these problems	118.92	0.93

Table 4.6.2 Mode and Mean for EAQ-22 items.

Item No.	Mean	Std. Deviation	Mode
EAQ 1	3.36	0.67	4
EAQ 2	3.39	0.71	4
EAQ 3	1.74	0.84	1
EAQ 4	3.24	0.79	4
EAQ 5	1.68	0.85	1
EAQ 6	3.39	0.75	4
EAQ 7	3.10	0.89	3
EAQ 8	1.61	0.84	1
EAQ 9	3.02	0.92	3
EAQ 10	1.58	0.77	1
EAQ 11	2.83	0.93	3
EAQ 12	3.12	0.86	3
EAQ 13	1.36	0.69	1
EAQ 14	3.17	0.88	4
EAQ 15	2.90	0.85	3
EAQ 16	1.55	0.82	1
EAQ 17	2.83	0.89	3
EAQ 18	2.06	0.84	2
EAQ 19	2.95	0.91	3
EAQ 20	2.53	0.96	3
EAQ 21	1.96	0.87	2
EAQ 22	1.30	0.61	1

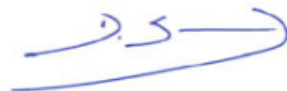
Table 4.6.3 Mode and Means for ESE-20 items.

Item No.	Mean	Std. Deviation	Mode
ESE1	6.61	2.64	10
ESE2	4.99	2.51	6
ESE3	5.71	2.43	5
ESE4	4.63	2.61	5
ESE5	5.85	2.72	8
ESE6	6.95	2.36	8
ESE7	7.24	2.57	10
ESE8	4.40	3.05	0
ESE9	5.57	2.98	5
ESE10	7.53	2.42	10
ESE11	6.82	2.57	10
ESE12	5.15	2.93	7
ESE13	6.23	2.71	6
ESE14	7.39	2.43	10
ESE15	5.78	2.97	10
ESE16	7.23	2.58	10
ESE17	6.28	2.68	7
ESE18	7.03	2.44	10
ESE19	7.52	2.35	10
ESE20	6.14	2.70	8

Appendix L: Statement of Principles for Post-graduate supervision

16. STATEMENT OF PRINCIPLES FOR POSTGRADUATE SUPERVISION		
IN A CONTEXT OF ACADEMIC FREEDOM AND WITHIN A FRAMEWORK OF INDIVIDUAL AUTONOMY AND THE PURSUIT OF KNOWLEDGE THIS AGREEMENT IS WRITTEN IN THE BELIEF THAT THERE IS A RECIPROCAL RELATIONSHIP AND MUTUAL ACCOUNTABILITY BETWEEN SUPERVISOR AND STUDENT.		
THE SUPERVISOR AND THE STUDENT: - Will establish agreed roles and clear processes to be maintained by both parties. In the case of joint supervision everyone's role needs to be clarified. - Will meet regularly and as frequently as is reasonable to ensure steady progress towards the completion of the proposal, research report, or dissertation or thesis. This time varies but the normal minimum requirement for face-to-face contact, spread across each year of registration is: 10 contact hours for an Honours project, 15 contact hours for a Masters by research report and 24 contact hours for a Masters by dissertation and a PhD. - Will keep appointments, be punctual and respond timeously to messages. - Will keep one another informed of any planned vacations or absences as well as changes in his or her personal circumstances that might impact on the work schedule. - Unplanned absences or delays should be discussed as soon as possible and arrangements should be made to catch up lost time. - Will ensure that research on animal or human subjects is conducted according to the procedures and the requirements of the relevant University Ethics committee. - Will together complete progress reports on the research project, as requested by each Faculty Graduate Studies Committee.		
THE SUPERVISOR: - Undertakes to provide guidance for the student's research project in relation to the design and scope of the project, the relevant literature and information sources, research methods and techniques and methods of data analysis. - Has a responsibility to be accessible to the student. - Will be prepared for meetings with the student. - This includes being up-to-date on the latest work in his/her area of expertise. - Will expect written work as jointly agreed, and will return that work with constructive criticism within a timeframe (a suggestion of 2-4 weeks) jointly agreed at the outset of the research. - Will provide advice that can help the student to improve his/her writing. This may include referrals for language training and academic writing. The supervisor will provide guidance on technical aspects of writing such as referencing as well as on discipline specific requirements. Detailed correction of drafts and instruction in aspects of language and style are not the responsibility of the supervisor. - Will support the student in the production of a research report, dissertation or thesis. Provision should be allowed for adequate, mutually respectful, discussion around recommendations made. - Will assist with the construction of a written time schedule which outlines the expected completion dates of successive stages of the work. - Will ensure the student has the opportunity to present work at postgraduate/staff seminars/national/international conferences as appropriate. - Will assist with the publication of research articles as appropriate. - Will discuss the ownership of research conducted by the student in accordance with the University guidelines and rules on intellectual property, co-authorship and copyright. - Will ensure that the research is conducted in accordance with the University's policy on plagiarism. - Will ensure that the student is made aware in writing of the inadequacy of progress and/or of any work where the standard is below par. Acceptability will be according to criteria previously supplied to the student. - Has a duty to refuse to allow the submission of sub-standard work for examination, regardless of the circumstances. If the student chooses to submit without the consent of the supervisor, then this should be clearly recorded and the appropriate procedures followed.	THE STUDENT: - Undertakes to work independently under the guidance of the supervisor. This includes reading widely to ensure that the literature pertinent to his/her chosen topic has been identified and consulted. - Is obliged to make appointments to see the supervisor and will arrange meeting times well in advance. - Will think carefully about how to derive maximum benefit from these contact sessions by planning what he/she wants in these sessions. - Should submit written work for discussion with the supervisor well in advance of a scheduled meeting. The kind and frequency of written work should be agreed with the supervisor at the outset of the research. - Undertakes to submit written work that is relatively free of basic spelling mistakes, incorrect punctuation and grammatical errors. Responsibility for the accuracy of language, the overall structure and coherence of the final research report, dissertation or thesis rests with the student. - Undertakes to heed the advice given by the supervisor and to engage in discussion around suggestions made. Ultimately the student has to take responsibility for the quality and presentation of the work. - Should strive, within reasonable bounds, to maintain a focus on his/her research area and to work within the agreed time schedule. - Will prepare material for presentations at seminars and conferences. - Undertakes to submit papers for publication. - Agrees to honour agreements about ownership of the research and in accordance with the University's guidelines and rules in relation to co-authorship, copyright and intellectual property. - Will ensure that the work contains no instances of plagiarism and that all citations are properly referenced and that the list of references is accurate, complete and consistent. - Agrees to work in accordance with the criteria of acceptability as supplied by the supervisor. - Undertakes not to place the supervisor under undue pressure to submit work for examination until the supervisor is satisfied that it has reached an acceptable level of quality.	I confirm that I have read and understood this statement and agree to be guided by its principles Name of Student: <u>Tyler Kortje</u> Student's signature: <u>[Signature]</u> Name of Supervisor: <u>Andrew Thatcher</u> Supervisor's Signature: <u>[Signature]</u> Name of Co-Supervisor: _____ Co-Supervisor's Signature: _____ Broad area of study: <u>Eco-anxiety and Self-efficacy</u> Provisional submission date: <u>15-Feb-2025</u> Degree: <u>MA Organisational Psychology</u> School: <u>Human Community and Development</u> Faculty: <u>Humanities</u> Date: <u>20-Apr-2024</u> Specific agreements pertaining to: ownership and joint publication, funding, etc. may be attached and signed.
GRIEVANCE PROCEDURES. It should be acknowledged that during the course of the research, both students and supervisors can feel aggrieved. In this event, matters should be dealt with as swiftly as possible by the parties involved and, if necessary, the appropriate Postgraduate Coordinators and Committees. There is, in addition, a University Grievance Policy to help guide deliberations. It is available on www.wits.ac.za/prospectivepostgraduate .		

Appendix M: Ethics Online Training Certificate

 Zertifikat Certificat Certificado Certificate	
Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale Promoting the highest ethical standards in the protection of biomedical research participants	
Certificat de formation - Training Certificate Ce document atteste que - this document certifies that  Clinical Trials Centre The University of Hong Kong Tyler Kortje a complété avec succès - has successfully completed Module 1 (2023) - Introduction to Research Ethics du programme de formation TRREE en évaluation éthique de la recherche of the TRREE training programme in research ethics evaluation	
Release Date: 2024/04/21 CID: G080A/TSP	 Professeur Dominique Sprumont Coordinateur TRREE Coordinator
APPROVED BY  SIWF Programmes de formation continue (2 crédits) Continuing Education Programs (2 credits)	FPH Programmes de formation postgraduée et continue Foederatio Pharmaceutica Helveticae
Ce programme est soutenu par - This program is supported by : European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-isc.gc.ca/2001.html) - Swiss Academy of Medical Science (SAMS/ASMS/AMF) (www.sams.ch) - Commission for Research Partnerships with Developing Countries (www.kip.ch)	

