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# EMERGING ADULTS' RISK PERCEPTION AND MINDFULNESS STRATEGIES CONCERNING CLIMATE CHANGE AND ENVIRONMENTAL COMMITMENT

DANIELI M. MERCADO RAMOS

41 Pages

Climate change continues to be an ever-growing threat to human development, and it is considered the most significant global health threat of the 21st century (Watts et al. 2017). Environmental commitment, risk perceptions, and mindfulness have been explored independently, yet no studies examine the intersectionality of these three relationships. Meanwhile, emerging adulthood and ethnicity are two factors that have not been studied regarding how they impact environmental commitment, risk perceptions, and mindfulness. Krettenauer and colleagues (2017, 2019) state that emerging adulthood plays a vital role in their commitment to the environment. The general hypothesis was that risk perception and mindfulness would positively relate to environmental commitment. At the same time, mindfulness would also serve as a moderator for predicting the relationship between risk perceptions and environmental commitment. Bivariate correlations, a regression analysis, and three between-samples t-tests to test the hypotheses with a total of 206 participants.

Overall, risk perception was highly related to environmental commitment, whereas mindfulness was not and did not moderate the relationship between them. Thus, with more emerging adults perceiving climate change risk, the more environmentally committed they are. This study did not demonstrate a difference in ethnicities, specifically between Latinx vs. non-

Latinx emerging adults. This study, therefore, works to advance research in this field, creating a more inclusive sample and focusing on the developmental period of emerging adulthood.

**KEYWORDS:** Environmental Commitment; Risk Perception; Mindfulness; Climate Change; Emerging Adulthood; Ethnicity

EMERGING ADULTS' RISK PERCEPTION AND MINDFULNESS STRATEGIES  
CONCERNING CLIMATE CHANGE AND ENVIRONMENTAL COMMITMENT

DANIELI M. MERCADO RAMOS

A Thesis Submitted in Partial  
Fulfillment of the Requirements  
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EMERGING ADULTS' RISK PERCEPTION AND MINDFULNESS STRATEGIES  
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D.M.M.R

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## CHAPTER I: INTRODUCTION

Climate change continues to be an ever-growing threat to human development, and it is considered the biggest global health threat of the 21st century (Watts et al. 2017). While climate change may be hard to perceive due to its unprecedented effects, its impact can happen immediately, unexpectedly, or delayed (Sanson et al. 2019). People often consider climate change a bigger risk for society than a personal risk since it can impact families and communities while also influencing policies, civic engagement, adaptation, and behavior (Wamsler & Brink, 2018). Given the importance of this global threat, it is not surprising that scholars have called for psychologists to study climate change effects (Gifford, 2008). A psychological perspective can help broaden the understanding of the individual-level influences such as values, attitudes, goals, habits, and comparisons that often are associated with how climate change is perceived. From a developmental psychology perspective, climate change related events increase exposure to risk factors such as diseases, stress, and the incapacity to meet everyone's needs across the lifespan (Sanson et al. 2019). The present research focused on expanding the knowledge of environmental commitment to understand better if and how it can be influenced by mindfulness and risk perceptions during emerging adulthood.

Emerging adulthood is characterized by building relationships and finding oneself (Sharp et al. 2007), in which less time is spent outside (in nature), and more time is spent with peers (Lam et al. 2014). Those factors may be associated with a "time out" or a "disconnect" from nature (Kaplan & Kaplan, 2002; Krettenauer, 2017). When comparing the effect of age on pro environmental behaviors, Krettenauer et al. 2019, found an inverse relationship between age and environmental behaviors (e.g., pro-environmental behaviors). Thus, it is suggested that environmental behaviors may fluctuate in influence and direction during emerging adulthood.

For example, there can either be no connection to the environment or significant involvement in the connectedness to the environment (Krettenauer et al. 2019).

It is essential to highlight that individual's behaviors may predict their perceptions of climate change. For example, climate change can influence a person's environmental identity (the connection that an individual has with the natural environment), leading to increased pro-environmental behaviors that can therefore lead to environmental commitment (Clayton, 2003). Arguably, understanding the threat of climate change should motivate us to act more environmentally committed but getting people to change their behavior is complex (Dreijerink et al. 2022). Furthermore, understanding the developmental period of emerging adulthood may help us find a broader scope of what factors influence environmental behaviors—essentially seeing if the commitment to the environment and risk perception may be associated. Therefore, encouraging a more comprehensive understanding of these factors could influence emerging adults to become more environmentally committed.

Culture is diverse and dynamic, and all agency determinants vary cross-culturally (Bandura, 2006). Lévy-Leboyer and colleagues (1996) mention that geographic location, culture, and values influence actions concerning climate change. Therefore, it is essential to understand that human experiences are not similar. While human experiences might vary across lifespan, they also vary in other contextual factors such as ethnicity. Across the literature, we see a difference and a lack of information regarding how different ethnicities experience climate change. According to (Islam & Winkle, 2017), climate change will disproportionately affect people of color (e.g., Latinxs) due to societal and financial issues. Exposure to lower socioeconomic status or geographical location (e.g., areas with toxins, no clean water, mining,

environmental and human-made hazards) (Goldberg et al. 2020; Leiserowitz et al. 2006 can lead to a different cultural context related to climate change.

## **Literature Review**

### **Environmental Commitment**

To better understand climate change, research should understand what contributes to a person's beliefs and how their behaviors impact the progress of climate change. Davis et al. (2009) indicate that humans are physically and emotionally dependent on the natural environment; therefore, dependence can affect their behavior. Those who perceive connectedness to the environment are most likely to consider what is good for the environment. Meanwhile, having greater knowledge can lead to increased action to prevent said progress; therefore, taking an initiative and using pro-environmentally behaviors can minimize one's negative impact on the environment. Pro-environmental behavior refers to "behavior that harms the environment as little as possible or even benefits the environment" (Steg & Vlek, 2009, p. 309). According to Puech and colleagues (2019) acting pro-environmentally requires changing attitudes into goals and actions that make a difference in the environment. Many individuals believe that pro-environmental behaviors are beneficial (Steg & Vlek, 2009) by focusing on energy conservation, transportation, waste avoidance, recycling, and spending habits (Palupi & Sawitri, 2018). Said behaviors are considered a multidimensional and a multifaceted challenge to influence individuals to enact these beliefs across the literature (Gifford, 2008). One way to help change those attitudes into behaviors is by studying the person-environment relationship, such as commitment to the environment (Davis et al, 2015). Pro-environmental behaviors and attitudes can be better understood through a person's commitment to the environment (Wesselmann et al. 2021).

Environmental commitment can be defined as how willing and engaged individuals act towards the relationship with nature (Kessler, 2019; Ito & Li, 2019). Commitment to the environment can differ from person to person, being seen as an individual experience. Based on Rusbult's (1980) commitment model, the bases of commitment are formed from satisfaction, alternatives, and investments, which can be narrowed down to different experiences with nature that require us to be conscious (Le & Agnew, 2003; Davis et al. 2008).

Being conscious of how one's behavior affects climate change can influence those person-environment relationships to help fuel connectedness and commitment to the environment (Davis et al. 2015). The commitment to the natural environment can be seen as a subjective experience depending on one's experiences/connections with the environment, and that connection would likely influence one's commitment levels. Most likely, those individuals with a high commitment level would more likely act beyond that self-interest, aware of what is better for the environment. Davis and colleagues (2009) highlight in their study that those emerging adults that reported having a high commitment to the environment were also more pro environmentally behaved. Thus, there remains a need to assess which factors can influence/enhance environmental commitment; therefore, this study will examine whether risk perceptions, mindfulness, and ethnicities play an essential part in environmental commitment.

### **Risk Perception**

Risk perceptions are the subjective judgments people make about the threat posed by a hazard (Slovic, 1999; Leiserowitz, 2006). Risk perceptions can be viewed as a multifaceted outcome stemming from individuals, families, and communities' beliefs, often framing how an individual's policy preferences, civic engagement, and adaptation behavior change (Lee et al., 2015). Risk perceptions are often influenced by an individuals' value system, such as their

internal preferences towards egoistic, socio-altruistic, and biospheric values (Van der Linden, 2015). Additionally, Van der Linden (2015) highlights that risk is a phenomenon that can be perceived differently even among countries due to real-world experiences and threats.

Climate change risk perceptions can assess various concerns depending on whether they are societal or personal perceptions, both of which are influenced by scientific, psychological, and social factors (Leiserowitz, 2006). Those factors include experiences, values, trust, and the levels of perceived risk (Van der Linden, 2015; Aksit et al. 2017; Lee et al. 2015). While susceptible to self-efficacy, attitudes, and knowledge about climate change (Hidalgo & Pisano, 2010), risk perceptions are a vital variable when measuring environmental commitment. Risks associated with climate change are often seen as either societal or personal risks. Wamsler and Brink (2018) show that people consider climate change a bigger risk for society than a personal risk, impacting families and their communities while influencing policies, civic engagement, adaptation, and behavior. Previous research has more readily investigated risk perception on climate change at the societal level, and this study attempts to understand this association at the personal or individual level.

Although risks can be prioritized differently across the lifespan, Spence and colleagues (2012) mention that climate change is viewed as a distant psychological risk influencing how people act. Individuals' risk perceptions are often influenced by the degree of support they receive from their network in their time of perceived risk (e.g., families) and when considering specific influences (Lévy-Leboyer et al. 1996). That support and individual perception are related to lower risk perception before an environmental disaster, meaning that people need to be more aware of the risk perception (Lee et al. 2015). Thus, there remains a need to understand how individuals become committed to the environment based on their perceived future risks.

## **Mindfulness**

Mindfulness is formally defined as an enhanced attentional awareness, acceptance of the present moment (Brown & Ryan, 2003) and influences connectedness across human nature (Howell et al. 2011). Davis and colleagues (2015) mention that person-environment relationships help fuel the connectedness and commitment to nature. For example, connectedness to the environment could be tied to an outdoor leisure activity, working outdoors, and experiences with environmental hazards (i.e., human-made hazards leading to health issues). Panno and colleagues (2018) highlighted that individual differences in trait mindfulness (i.e., the tendency to be aware of the present moment) could shape pro-environmental attitudes by turning them into behaviors. Davis and colleagues (2015) mention that knowing how one's behavior affects climate change is important and could be described as mindful.

Langenbach and colleagues (2019) explained how to turn attitudes into action, acknowledging an attitude-behavior gap in environmental behaviors. They suggest that people might understand the need to be pro-environmental and environmentally committed, yet do not actively engage in behaviors that affirm their beliefs. Such beliefs may suggest that the need for increased cognitive control mindfulness (i.e., the ability to align one's behaviors with current goals) is further tied to attitudes and behaviors (Inzlicht et al., 2015). Because mindfulness involves being aware and conscious, helping create goal-directed behaviors may increase environmental commitment.

Individual mindfulness may coincide with increased motivation to participate in (or support) climate adaptation actions. These concepts may be linked to the increased acknowledgment (or an adequate representation) of climate change that was identified. Wamsler and colleagues (2018) mentioned that the more mindful a person is regarding environmental

attitudes and behavior, the less likely the participants were to deny climate change. Implications from their work are important because they show that being mindful of climate change and its threat can help serve as a moderator towards more environmentally committed behaviors. The authors highlight that mindfulness, attention, and awareness facets are influential to the cognitive reappraisal of emotion (i.e., emotion regulation). Therefore, a positive influence occurs over acknowledging climate change focused behaviors (i.e., motivation and climate adaptation actions are influenced by individual mindfulness). Accordingly, individual mindfulness might also help overcome key psychological barriers that limit climate adaptation, such as certain ideological worldviews, risk perceptions, and compassion that may hinder the collective ability and willingness to confront major environmental challenges (Gifford, 2011).

Mindfulness involves being aware of and accepting internal and external experiences (e.g., fear) (Gu et al. 2016). These feelings of connectedness are also associated with age, during childhood and infancy. They related to the parent's influences (e.g., if they encouraged outdoor play, partook in environmentally aware behaviors, encouraged environmental commitment, and other pro-social behavior towards nature) (Krettenauer et al. 2019). During adolescence and emerging adulthood, Wamsler and colleagues' (2018) showed a positive correlation between mindfulness and being motivated by social factors to take adaptation action (i.e., being encouraged by friends and family, reducing the risk for others, and impacting morals). Additionally, they mention that "mindfulness is an individual trait and possibly a practice or state—has the potential to open new pathways towards sustainable climate adaptation, which require further exploration, and thus call for increased research on inner dimensions (or interiority) to support inner-outer transformation" (Wamsler et al., 2018, p.59).

## **Environmental Identity and Cultural Background**

One's cultural background can influence various attitudes, beliefs, and behaviors. Cultural background may likely impact one's attitude towards environmentally focused behaviors and a general perception of one's connection to the natural environment, such as environmental commitment. Leiserowitz and Akerlof (2010) understood that most psychological research on environmental issues that has been conducted in the U.S. demonstrated predominantly White, non-Latinx participants, which was not representative of the racial disparities in the effects of climate change. Such samples do not represent the broad diversity of ethnicities and cultural backgrounds in the U.S. populace. One population that is often understudied is the Latinx community. According to the U.S. Census Bureau (2019), Latinxs are among the highest total population of ethnic minority groups in the U.S. (accounting for 17.1% of the population). Therefore, it is essential to understand if identifying as Latinx can influence the difference in connectedness to the environment compared to other cultural backgrounds.

Eom and colleagues (2016) found that Latinx nations were less individualistic than the U.S. regarding environmental concern and action (e.g., environmental behaviors). Whereas Burgos-Cienfuegos and colleagues (2015) demonstrated that when Latinx emerging adults are exposed to other cultures, those interactions can influence their social behaviors and concern for others at a greater rate than emerging adults that were not Latinx. According to Farrokhi and colleagues (2020), cognitive, empirical, sociocultural, and sociodemographic factors influence climate change risk perception. Additionally, Non-Latinx Whites tend to be more dismissive and less alarmed about climate change than other ethnicities (Perilla et al. 2002). Goldberg and colleagues (2020) showed that Latinxs had a higher risk perception than non-Latinx Whites. The

differences in risk perception could be because Latinxs perceive climate change as a health threat, making their risk perception levels higher than non-Latinxs (Akerlof et al. 2015).

In contrast, ethno-racial minorities such as Latinxs and African Americans show the greatest concern for climate change (Pearson et al. 2018; Leiserowitz and Akerlof, 2010). Although the literature shows contradictory information regarding Latinx and Non-Latinx involvement in climate change and their risk perceptions, yet the same cannot be said for mindfulness. Because of subjective differences in how people of different ethno-racial backgrounds experience and view climate change, one understudied area that may influence the relationship between risk perceptions and environmental commitment is mindfulness. Therefore, this study aims to expand the research on Latinx and Non-Latinx emerging adults' commitment to the environment.

### **Purpose of the Study**

Past literature has tied risk perception to either mindfulness or environmental commitment, yet there is still no clear description of how the three variables influence one another (Eom et al. 2016). This research expands the understanding that ethnicity has on predicting environmental commitment and the difference caused by either risk perception and/or mindfulness. The goals of the current study were to a) describe if risk perceptions and mindfulness can predict environmental commitment, b) describe whether an individual's degree of mindfulness moderates the association between risk perception and environmental commitment, and c) to investigate how the models differ significantly by ethnic group (i.e., Latinx and Non-Latinx's).

Hypothesis 1 – Mindfulness positively correlates with environmental commitment

Hypothesis 2 – Risk perception positively correlates with environmental commitment.

Hypothesis 3 – Mindfulness moderates the correlation between risk perception and environmental commitment.

Research Question – Do these three variables differ by ethnicity (i.e., Latinx vs. Non-Latinx)?

## CHAPTER II: METHODS

### **Participants**

A total of two hundred and six participants took part in this study. Participants were between 18 to 24 years with a median age of 19. A majority identified as female ( $n = 186$ , 90.29%), a minority as male ( $n = 14$ , 6.80%). Some participants identified outside the gender binary ( $n = 5$ , 2.40%) and one did not answer (0.29%). Ethnically, our students identified as Latino/a/x ( $n = 26$ , 12.60%), as Non-Hispanic White ( $n = 135$ , 65.50%), African American ( $n = 19$ , 9.22%), Asian American ( $n = 6$ , 2.90%), Native American ( $n = 1$ , 0.50%), or Multiracial ( $n = 5$ , 2.40%). Participants also had the option to select other ( $n = 8$ , 3.90%) and prefer not to say ( $n = 6$ , 2.90%). Those participants that identified as Latino/a/x were asked to answer an Ethno-Racial Identity question in which they identified the following way, Latino/a/x ( $n = 14$ , 6.8%), Hispanic ( $n = 11$ , 5.3%) and Chicano/a ( $n = 1$ , 0.5%).

### **Measures**

#### **Environmental Commitment**

The environmental commitment scale by Davis et al. (2009), was designed with two categories in mind: 1) psychological attachment and 2) long-term orientation (i.e., thinking about the future). The original validation of the scale had a high level of reliability ( $\alpha = 0.91$ ; see Davis et al., 2009). The scale consists of 11 items and uses a 9- point response scale, ranging from 0 (do not agree at all) to 8 (agree completely) regarding how one views their relationship with the natural environment. A sample item is “Feeling a connection with the environment is important to me.” Following previous validation, the items of the scale means were summed to obtain the average mean score of the scale. The reliability of the measure in the current study was also high ( $\alpha = 0.85$ ).

### **Climate Change Risk Perceptions**

The climate change risk perception scale created by Leiserowitz (2006) examines how Americans' risk perceptions about climate change relate to psychological and socio-cultural factors. It was designed to predict the levels of concerns due to climate change. The original validation of this scale yielded high levels of reliability ( $\alpha = 0.94$ ; Leiserowitz, 2006) and consists of 9 items. All the items were constructed based on the following variables: holistic concern; likelihood measures of worldwide and local impacts of global warming on standards of living, water shortages, and disease; the seriousness of global warming for non-human nature; and the seriousness of the current impacts of global warming around the world. The scale asks "How likely do you think it is that each of the following will occur during the next 50 years due to global warming?" and a sample item is "Increased rates of serious disease worldwide." The scale includes a 4-point response scale of perceived risk, ranging from 1 (none) to 4 (very). Following previous validation, the items of the scale means were summed to obtain the average mean score of the scale. After running an analysis with the data, collected for this study, the level of reliability for the climate change risk perceptions scale was ( $\alpha = 0.85$ ).

### **Mindful Attention Awareness Scale**

The Mindful Awareness Scale (Brown & Ryan, 2003) is design to assess enhanced self-awareness. It consists of 15 items, and uses a 6-point response scale, ranging from 1 (almost always) to 6 (almost never) in terms of how frequently one recalls experiencing the situation described in each item. An example item is "I find it difficult to stay focused on what's happening in the present." Across previous studies it has demonstrated reasonable internal consistency ( $\alpha = 0.80 - 0.87$ ; Brown & Ryan, 2003). Following previous validation, the items of

the scale means were summed to obtain the average mean score of the scale. After running analysis, the reliability of the scale in the current study was ( $\alpha = 0.90$ ).

### **Ethno-Racial Identity**

Participants answered a dichotomous question where they were asked to self-identify as either 1 = “I do not identify as Latino, Chicano, or Hispanic” or 2 = “I identify as Latino, Chicano, or Hispanic.” Individuals who identified with the Latino, Chicano, or Hispanic communities were combined into a larger and more inclusive demographic identity of Latinx. This was done because some participants may not be accustomed to the term Latinx. We offered a subsequent question that allowed Latinx participants to describe their cultural identity (e.g., Chicano, Hispanic, Latino, Latina, Latinx), though we did not analyze these identity groups separately.

### **Procedure**

The study was approved by the Illinois State University Institutional Review Board (IRB-2021-179). It employed a quantitative non-experimental correlational research design that examined the relationships between environmental commitment, risk perceptions, and mindfulness. All variables were self-reported measures. First, parameters were established to determine the number of participants required to have power. A priori power analysis was performed for every hypothesis using the software GPower 3.1 to establish the estimated sample size needed to detect a specified level of effect and significance between the variables. A two-tailed correlation point bivariate test was run for hypotheses 1 and 2. Previous studies were used as a basis for the estimated effect sizes within the current study. In a study exploring hypothesis 1, Panno and colleagues (2018) used a sample of 297 undergraduate students. The authors proposed that mindfulness is related to environmental behaviors and belief in climate change

through social dominance orientation and found a correlation of  $r = .20$ . After running the power analysis based on the  $r = .20$  using an  $\alpha = .05$  and a considered power = 0.80, the projected sample size needed for the study with the correlation was  $N = 191$ .

In a study exploring hypothesis 2, Xie and colleagues (2019;  $N = 921$ ), an extension of Van Der Linden (2015), looked to predict risk perceptions and how willing participants were to engage in mitigation behaviors for climate change. They acquired an  $r = .039$ . After running the power analysis based on  $r = .039$  using an  $\alpha = .05$  and a considered power = 0.80, the projected sample size needed for the present study with the correlation was  $N = 46$ .

Unlike the first two hypothesis, there were no suitable articles that could provide a specific effect size for hypothesis 3's power analysis. As such, Cohen's (1998) guidelines were used to compute 0.15 as medium effect size and using an  $\alpha = .05$  and a considered power = 0.80. The projected sample size needed for the study with this effect size is approximately  $N = 55$ . Hypothesis 1's estimated sample size was selected as the target sample size as it was both reasonably obtainable given the resource constraints and exceeded the estimated sample sizes for all other hypotheses.

Participants were recruited in 2021 during the Covid19 pandemic via university research software and completed the study online on their computer or smart device. First, participants provided informed consent, and then they answered a series of questions to ensure that they met the study criteria. Second, since emerging adulthood has been identified as a developmental period in which environmental behaviors and environmental commitment fluctuate (Krettenauer et al. 2019; Ojala & Bengtsson, 2018; Sanson et al. 2019) one of the criteria for participation in this study was to be an emerging adult (ages 18 to 25). Additionally, the participants needed to be enrolled at the associated university. Participants who met the study criteria were redirected

to a Qualtrics survey, which comprised demographic questions and three different scales: 1) Environmental Commitment Scale (11 items), 2) Climate change Risk Perception Scale (9 items), and 3) Mindful Attention Awareness Scale (15 items) (see Appendix A). After the data was collected through Qualtrics it was downloaded to SPSS in which the minimums and maximums of the three scale were changed by Qualtrics (see Chapter III: Results) yet it did not impact data analyses.

### **Analyses and Missing Data Analyses**

Four forms of quality checks were included in the survey; two attention checks, one outlier evaluation based the length of time on the survey, and additional data cleaning. Initially, three hundred and seventy-five students completed the study. Participants who failed to correctly identify the attention checks were removed from the dataset. Two hundred and six participants correctly answered both attention checks. The estimated time to complete the survey was 30 minutes. Participants who completed the study under two standard deviations above or below the median completion time were excluded. Missing and bad data were discarded through the following processes: two participants were eliminated because they did not fall under the 18 to 25 years category, 33 were eliminated because they did not complete the scales. After all data cleaning, 206 participants were included into the final sample. The final sample exceeded the minimum sample size of 191 participants required for adequate power to assess the relations among the three variables (mindfulness, risk perception, and environmental commitment).

### **Data Analysis Plan**

SPSS (28.0.0) was used for conducting all data analyses. First, two-tailed bivariate correlations were conducted to test hypotheses 1 & 2. Hayes PROCESS macro model 1 (Hayes, 2022) was utilized to examine moderation for hypothesis 3 (with a decomposition technique for

probing interactions and 10,000 bootstraps). Age and ethnic identity were controlled for within the moderation model. A random generator was used to select data randomly to assess possible ethnic differences between variables to account for different sample sizes. Finally, I conducted a series of three between-samples t-tests to analyze the questionnaires by ethno-racial identity (i.e., Latinx and Not-Latinx).

## CHAPTER III: RESULTS

In the following section, the results of the study will be broken down first by initial analyses (e.g., descriptive statistics) and then by each hypothesis, specifically, 1) identify whether mindfulness and environmental commitment are positively correlated, 2) identify whether risk perception and environmental commitment are positively correlated, and 3) identify if mindfulness serves as a moderator for risk perception and environmental commitment. Finally, the probing research question on group-level differences in the self-report measures by ethno-racial identity is presented.

The descriptive statistics for the three key measures. The environmental commitment scale mean was  $M = 5.88$  ( $SD = 1.30$ ),  $Min = 1.75$  and  $Max = 8.42$ . Environmental commitment was non-normally distributed, with skewness of  $-.36$  ( $SE = .17$ ) and kurtosis of  $.17$  ( $SE = .34$ ). The risks perception scale mean score was  $M = 3.22$  ( $SD = 0.48$ ),  $Min = 1.89$  and  $Max = 4.00$ . Risk perception was non-normally distributed, with skewness of  $-.17$  ( $SE = .17$ ) and kurtosis of  $-.54$  ( $SE = .34$ ). Whereas the mindfulness attention awareness scale mean score was  $M = 3.46$  ( $SD = 0.71$ ),  $Min = 1.75$  and  $Max = 5.31$ . Mindfulness was non-normally distributed, with skewness of  $.23$  ( $SE = .17$ ) and kurtosis of  $-.15$  ( $SE = .34$ ).

Next, the hypothesized correlations between mindfulness and environmental commitment (hypothesis 1), and risk perception and environmental commitment (hypothesis 2) were examined. Table 1 displays the correlations, indicating that risk perception was significantly positively correlated to environmental commitment, whereas mindfulness was not significantly correlated.

**Table 1***Bivariate correlations among the Mindfulness, Risk Perception and Environmental Commitment**Scales*

Measure	<i>M</i>	<i>SD</i>	1	2	3
1. Mindful Attention Awareness Scale	3.46	0.71	(.90)		
2. Risk Perception Scale	3.22	0.48	-.041	(.85)	
3. Environmental Commitment Scale	5.88	1.30	-.108	.239**	(.85)

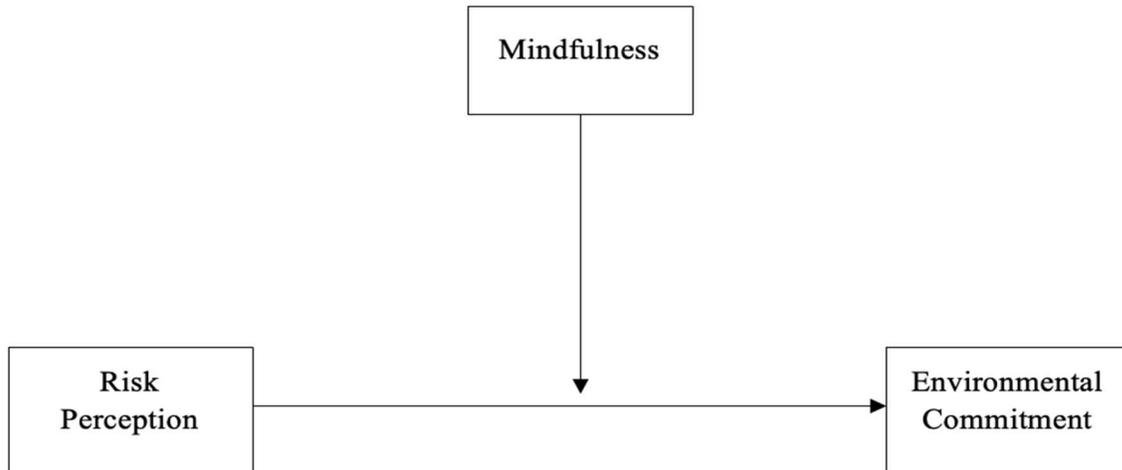
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\*\* $p < .01$ ; values on the diagonal are Cronbach's alpha coefficients.

Third, the hypothesized moderation of mindfulness on a direct effect between risk perception and environmental commitment (hypothesis 3), was tested using Hayes's (2021) PROCESS program in SPSS (see Figure 1). Mindfulness was examined as a moderator of the relationship between risk perception and environmental commitment with a significant main effect model,  $\Delta R^2 = .067$ ,  $F(3, 202) = 4.841$ ,  $p = .003$ . The interaction term between risk perception and mindfulness explained a nonsignificant decrease in variance in environmental commitment,  $\Delta R^2 = .003$ ,  $F(1, 202) = .065$ ,  $p = .798$ . Thus, mindfulness was not a significant moderator of the relationship between risk perception and environmental commitment.

## Figure 1

### *Regression Analysis for the Relationship Between Risk Perception and Environmental Commitment as Moderated by Mindfulness*



As a part of the research question, a between samples t-tests was run to assess whether ethnicity influenced the three main variables (environmental commitment, risk perception, and mindfulness). The ethnicity variable was categorized as Latinx and Non-Latinx. Given the total sample of the Latinx participants was ( $n = 26$ ), through a random number generator a total of ( $n = 26$ ) non-Latinx participants was selected. After having the same number of participants, the between samples t- test were conducted in which equal variances were not assumed. There was a nonsignificant effect for environmental commitment,  $t(48.44) = -1.62, p = .112, d = -0.45$ , with Latinx participants reporting lower scores ( $M = 5.69, SD = 1.53$ ) than non-Latinx participants ( $M = 6.33, SD = 1.28$ ). There was a nonsignificant effect for risk perception,  $t(41.92) = -.38, p = .705, d = -0.10$ , with Latinx participants reporting lower scores ( $M = 3.22, SD = .33$ ) than non-Latinx participants ( $M = 3.26, SD = .53$ ). Finally, there was also a nonsignificant effect for mindfulness,  $t(38.69) = -.22, p = .829, d = -0.04$  with Latinx participants reporting lower scores ( $M = 3.44, SD = .47$ ) than non-Latinx participants ( $M = 3.47, SD = .87$ ).

## CHAPTER IV: DISCUSSION

Climate change risk perceptions have been known to measure various concerns depending on whether they are societal or personal perceptions, influenced by scientific, psychological, and social factors (Leiserowitz, 2006). Previous research has shown that environmental commitment is a subjective experience that influences individuals' willingness to connect with the environment (Davis et al. 2015). Furthermore, mindfulness can also be considered an individual experience that can guide environmentally committed behaviors (Davis et al. 2015). These three different variables have in common the influence that personal experiences have on them, whether for more positive or negative involvement regarding climate change. Thus, the study sought to expand the current understanding of climate change regarding how risk perceptions and mindfulness influence environmental commitment in emerging adults. Additionally, it was hypothesized that there might be potential differences between these variables by ethnic background (i.e., Latinx vs. non-Latinx).

The current study provided mixed results when compared to previous literature. When looking at the initial correlations for the key variables, only one hypothesized correlation was statistically significant. Climate change risk perception displayed a significant positive relationship to environmental commitment. This result was similar to Wesselmann and colleagues (2021), who indicate that environmental commitment gives a better understanding of a person's behaviors and attitudes, which can explain the significant association between risk perception and environmental commitment. These results suggest that the more committed to the environment emerging adults are, the more risk is perceived regarding climate change, which leads to willingness. Wamsler and Brink's (2018) study also supports these findings by highlighting that risk perceptions become more heightened by other societal factors; in this case,

environmental commitment can be seen as that societal factor that influences emerging adults' risks perceptions regarding climate change. This could be because they, as individuals, are invested in the environment and understand that others around them value the environment (Davis et al. 2015).

In contrast, mindfulness was not significantly correlated with environmental commitment. This result shows a disparity between hypothesis 2 and previous literature, which shows a connection between mindfulness and environmentally focused behaviors (Panno et al., 2018). Unlike Wamsler and colleagues (2018), who found a positive correlation between mindfulness and being motivated by social factors to take adaptative actions, the current study was unable to replicate these results. This could be because of the time out with nature that emerging adults might have (Krettenauer, 2017). It indicates that they are not mindful of the present natural environment, which leads to there not being a correlation between mindfulness and environmental commitment.

Further, the current study did not find evidence for the hypothesized moderation of mindfulness on the connection between environmental commitment and risk perception. Therefore, mindfulness did not influence any change in variance in the association between risk perception and environmental commitment, which was a significant relationship. However, this result does not replicate findings from previous studies showing that since the interaction term was not significant, mindfulness could not moderate the association between risk perception and environmental commitment. It is important to note that Panno and colleagues (2018) highlight that environmentally focused behaviors can be related to environmental commitment. Yet, it is important to understand that getting a person to change their behavior is complex (Dreijerink et al. 2022), which could explain why mindfulness was not a significant moderator between the

association of risk perceptions and environmental commitment. The current study did not implement an intervention of mindfulness with participants. It may be that the participants were not entirely aware of their present behaviors and what they need to do to act against the risk they perceive to live with an increased environmentally committed. Wamsler and colleagues (2018) found that being mindful could be linked to more knowledge of climate change and could change behaviors specifically to those with high-risk perceptions concerning climate change.

The literature related to the variables of environmental commitment, risk perception, and mindfulness presents contradictory information regarding how different ethnicities view them. Further, the present study explored potential differences between ethno-racial identity categories on the three key variables. Because only twelve percent of the participants identified as Latinx, associations with the larger dataset would not have created adequate comparison groups. To account for this lack of representation of Latinx participants, twelve percent of the non-Latinx sample was selected as a comparison group in these analyses. Burgos-Cienfuegos and colleagues (2015) highlighted that Latinx emerging adults are exposed to other cultures, influencing their concerns for others. The results contradicted this statement seeing as no difference was observed for either Latinx or non-Latinx participants. Neither environmental commitment, risk perception, nor mindfulness differed significantly between being either Latinx or non-Latinx.

Because most of this data was collected during peak moments in the COVID-19 pandemic, it could explain the fluctuation in the levels of commitment in the participants. The total sample of this study consisted of undergraduate students that started their studies during the pandemic. With the participants being emerging adults, it is essential to note that past literature has highlighted a “time out” with nature, specifically in emerging adults. Yet, one factor that was not accounted for was a pandemic; this situation could have influenced a disconnect or “time

out” with the natural environment. Most likely influencing mindfulness and climate change risk perception and their environmental commitment. Rava and Hotez (2021) describe common themes that they found in their study in terms of mindfulness. The authors discuss how emerging adult students noted that COVID-19 has brought up the emergence of mental health issues and a limited time outside. Their results showed that the emerging adult students demonstrated being mindful of positive and negative well-being because they understand their mental health is not doing well. Emerging adults in college are burned out from all the online schoolwork, but with those small-time lapses in which they are able to get a couple of minutes outside and experience nature, even during the winter, they feel instantly better and are ready to take on the day. Similarly, Hawes et al. (2020) found that anxiety symptoms in emerging adults increased after the pandemic and that home confinement was one of the reasons for that increase in general anxiety.

Overall, Botzen et al. (2021) indicate that the COVID-19 pandemic can serve as a learning experience on how we can deal with current and future effects caused by climate change. In terms of environmental issues, it is essential to note that since most communication and media sources have been presenting more pressing topics (e.g., the COVID-19 pandemic), it could have influenced mindfulness, risk perception, and environmental commitment levels. This could be because people are focused on meeting basic needs that have been impacted during the pandemic and staying healthy, highlighting the disproportionate and unprecedented effects of climate change.

### **Implications of Current Research**

The current study appears to be the first to investigate ethnic differences in emerging adults concerning how climate change risk perceptions and mindfulness could relate to

environmental commitment. As a result, the current study did not establish ethnic differences in how emerging adults perceive environmental variables such as risk perception and mindfulness. Demonstrating how important it is to increase research in non-weird populations, even more so in research in which environmental factors and developmental periods are explored. This study further establishes the association between climate change risk perceptions and environmental commitment, demonstrating that emerging adults perceive climate change as a risk and influence their relationship with nature and lead a more environmentally committed life. It helps show that the knowledge about climate change is present in these participants and that it can be possible to expand that knowledge to others. Additionally, this research provides more data for current theories, such as the environmental commitment theory in which willingness to sacrifice for the environment is present.

Furthermore, the study demonstrates that emerging adults care about the environment, are environmentally committed, and perceive risks. They provide an intersectional view on how we view the environment, climate change, and the factors that can influence it. Moreover, research can encourage younger and older generations to commit to the environment and act to benefit the environment (e.g., pro-environmental behaviors), prompting a healthy future for the planet and everyone.

### **Limitations and Future Directions**

The current study had multiple limitations. First, the data was collected from an undergraduate sample through an online questionnaire for which extra credit was offered on university software. Because there was no email invitation, fewer students could access the study. The only undergraduate students who have access to the software are students taking psychology classes, which can be considered a limitation because these psychology students

might better understand the general concepts of mindfulness and risk perception, which might influence this study's results. Second, the current study would have benefited from increased ethno-racial diversity, allowing for a stronger comparison between Latinx and non-Latinx participants. Having more Latinx participants could've led to different results in the between samples t-tests, and most of the general data collected from the participants could've been used. Thirdly, this study would've benefited from a mindfulness scale related explicitly to climate change. If a climate change mindfulness scale had been used, it would've been possible to obtain similar results to previous studies in which mindfulness was statistically significantly associated with environmental commitment and risk perception.

Ideally, it would be interesting for future research to employ either a longitudinal or cross-sectional design so that it would be possible to explore how a person's connection to the environment fluctuates but, more importantly, to see how their environmental commitment changes as well. These designs can also help explore other factors alongside risk perceptions, and mindfulness can influence a person's environmental commitment. Additionally, those designs can help researchers understand what experiences and needs can impact environmental commitment specifically; it can explore them from an individualistic or collectivist point of view. Lastly, future research might explore gender differences within those ethnic differences presented in this study. Thus, creating different pathways to predict environmental commitment, risk perceptions, and mindfulness.

## **Conclusion**

Literature has stated that risk perception, connectedness to the environment, environmental commitment, and mindfulness may fluctuate during emerging adulthood (Krettenauer et al. 2019). Emerging adults' commitment to the environment may fluctuate during

this developmental period. Specifically, it demonstrated that risk perceptions about climate change highly impact environmental commitment. Therefore, the more risk emerging adults perceive, they are more likely to be committed to their environment. Whereas mindfulness was not related to environmental commitment, it did not serve as a moderator between the association between risk perception and environmental commitment. Therefore, emerging adults demonstrate a commitment to the environment while also perceiving risk perceptions and are not mindful. Additionally, a test analysis was conducted to explore any differences between ethnicities. Results indicated no difference in neither Latinx and non-Latinx emerging adults' mindfulness levels, risk perception levels and their environmental commitment. This result could be because of the small amount of data that was able to be used or because of the "time out" in nature caused by the Covid19 pandemic.

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APPENDIX: QUESTIONNAIRE

<b>1. What is your age?</b>	
<b>2. What is your gender identity?</b>	Female (1) Male (2) Nonbinary (3) Transgender (4) Gender neutral (5) Queer (6) Other (7) _____
<b>3. How do you identify ethnically?</b>	Latino or Latina (1) If 1 follow to question 4 African American (2) Asian American (3) Anglo or Non-Hispanic White (4) Native American or Alaskan Native (5) Multiracial (please identify below) (6)  _____ Other: (7)  _____ I would prefer not to say (8)
<b>4. Which identity do you most closely identify with?</b>	Hispanic Latino or Latina Latinx Latiné Chicano or Chicana Chicanx Other: please identify
<b>5. How many people lived in your family household</b>	

<b>while you were growing up?</b>	
<b>6. Which generational status do you most closely identify with in the United States?</b>	1st generation (I immigrated to the United States) (1) 2nd generation (My parents immigrated to the United States) (2) 3rd generation (My grandparents immigrated to the United States) (3) 3+ generations (My family has been in the United States for more than three generations) (4) I would prefer not to say (99) <b>Coded as missing</b>
<b>7. What is your family income?</b>	
<b>8. How would you describe your living environment?</b>	Rural (1) Small town (2) Suburban (3) City (4) Other (5) _____
<b>9. Are you currently in school?</b>	No (1) Yes (2)
<b>10. What is the highest level of education that you completed</b>	Elementary school (1) Middle school (2) Some high school (3) High school graduate (4) Some college (5) Graduated from trade school/associate's degree (6) Graduated college with bachelor's degree (7) Graduated college with advanced degree (MA, PhD., JD, MD est.) (8) Unknown (9) I would prefer not to say (10)

Commitment to the environment (Davis et al. 2009)

To what extent does each statement describe your attitudes about your relationship with the natural environment? Please use the following scale to record your answers.

	0 Do not agree at all	1	2	3	4 Agree somewhat	5	6	7	8 Agree completely
1. I am interested in strengthening my connection to the environment in the future.									
2. I feel strongly linked to the environment.									
3. When I make plans for myself, I take into account how my decisions may affect the environment.									
4. It seems to me that humans and the environment are interdependent.									
5. It makes me feel good when something happens that benefits the environment.									
6. Feeling a connection with the environment is important to me.									
7. I expect that I will always feel a strong connection with the environment.									
8. I believe that the well-being of the natural									

environment can affect my own well-being.									
9. It is unlikely that I'll feel a connection to the environment in the future. (R)									
10. I feel very attached to the natural environment.									
11. I feel committed to keeping the best interests of the environment in mind.									

Risk Perceptions Index (Leiserowitz, 2006)				
	(1) None	(2)	(3)	(4) Very
1. How concerned are you about global warming?				
How likely do you think it is that each of the following will occur during the next 50 years due to global warming?				
2. Worldwide, many people's standard of living will decrease.				
3. Worldwide water shortages will occur				
4. Increased rates of serious disease worldwide.				
5. My standard of living will decrease.				
6. Water shortages will occur where I live.				
7. My chance of getting a serious disease will increase.				
8. How serious of a threat do you believe global warming is to non-human nature?				
9. How serious are the current impacts of global warming around the world?				

Mindful Attention Awareness Scale (Brown and Ryan, 2003)

Below is a collection of statements about your everyday experience. Using the 1– 6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be.

	1 Almost always	2 Very frequently	3 Somewhat frequently	4 Somewhat infrequently	5 Very Infrequently	6 Almost Never
1. I could be experiencing some emotion and not be conscious of it until sometime later.						
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.						
3. I find it difficult to stay focused on what's happening in the present.						
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.						

5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.						
6. I forget a person's name almost as soon as I've been told it for the first time.						
7. It seems I am "running on automatic" without much awareness of what I'm doing.						
8. I rush through activities without being really attentive to them.						
9. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.						
10. I do jobs or tasks automatically, without being						

aware of what I'm doing.						
12. I drive places on "automatic pilot" and then wonder why I went there.						
13. I find myself preoccupied with the future or the past.						
14. I find myself doing things without paying attention.						
15. I snack without being aware that I'm eating						