SOCIAL AND ENVIRONMENTAL INFLUENCES ON SUBJECTIVE WELL-BEING

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ABSTRACT

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Subjective well-being, a broad term which refers to how individuals evaluate the quality of their own lives as well as the presence and intensity of emotions they experience on a day-to-day basis, has been gaining increasing attention in both academic and policy circles as a useful measure of human well-being. This interest has inspired a large research literature spanning over 170,000 books and articles to date. However, few sociologists have engaged with this topic, which is a shortcoming considering that we are well suited to examine the interplay between objective conditions and subjective perceptions. Furthermore, only a small subset of studies considers the influence of experiences in nature and the conditions of the biophysical environment on subjective well-being. In this study, I addressed these gaps in the literature by examining the social and environmental influences on individual subjective well-being. I conducted three distinct studies, each at a different level (i.e. state, national, and cross-national). As a sociologist, I remained attentive to how factors such as class, gender, and race and ethnicity contribute to social inequalities in subjective well-being. I conclude with an assessment of subjective well-being as an indicator of sustainable development that reflects the mutual flourishing of humans and the rest of the natural world.

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Chapter 1:

Introduction

The question of what constitutes a good life has captivated philosophers and scholars since ancient times (Kesebir and Diener 2008). Now, social scientists are examining this question through research on subjective well-being (SWB), a broad concept which refers to the ways in which individuals assess the quality of their own lives (Diener, Lucas, and Oishi 2018). SWB is generally defined as having two distinct but related components: the cognitive component, which reflects an individual's overall life satisfaction, and the affective component, which corresponds with the experienced presence and intensity of positive and negative emotions in one's life (Diener et al. 2018).

Research on SWB has become prominent in recent years because it is increasingly being recognized as promising indicator of human well-being (Stone and Mackie 2013). This is in part because it offers an alternative to economic metrics such as household income or gross domestic product (GDP) which are often used to evaluate individual and societal well-being. These indicators, while valuable in some respects, have been widely criticized based on concerns with the assumption that well-being is simply a function of wealth, that they overlook social inequalities, and that there are many important aspects of individuals' lives besides the goods and services they can purchase (Stiglitz, Fitoussi, and Durand 2019; Graham, Laffan, and Pinto 2018; Aitken 2019). They also do not consider degradation of the natural environment, which is a critical shortcoming in a world grappling with grave environmental problems (Dietz 2015; Dasgupta 2001).

SWB, on the other hand, has many characteristics which suggest that it may be a useful measure of human well-being. It encapsulates multiple dimensions of well-being (i.e. life

satisfaction, positive and negative affect) and is receptive to the myriad factors which influence it, whether positively or negatively, including inequality, underdevelopment, and environmental degradation (Dietz 2015). It has also been praised for its democratic nature which allows individuals to say for themselves how their lives are going, rather than relying on objective external indicators (Diener, Lucas, and Oishi 2009). For these reasons, scholars and policymakers have called for national accounting systems which include SWB (Stiglitz et al. 2019; Diener, Oishi, and Lucas 2015; Krueger 2009; Brooks 2008). Several guides on best practices for measuring SWB cross-nationally have been published by institutions such as the Organisation for Economic Cooperation and Development (OECD 2013), the United Nations (Anand 2016), and the National Research Council (Stone and Mackie 2013) and over 40 nations presently measure it among their populations (Diener et al. 2015).

The promise of research on SWB for understanding what contributes to a good life is reflected in a large literature which has developed on the topic, spanning over 170,000 articles and books published to date (Diener et al. 2018). Most of this research is situated in the fields of psychology and economics and examines the association between social factors such as income, gender, age, and life experiences, such as getting married, and SWB. However, sociological research on SWB is very limited, which is unfortunate as sociologists are well-suited to explore the connections between objective circumstances and subjective realities. Furthermore, there is a lack of research on how SWB is influenced by conditions of the biophysical environment and experiences in nature. Understanding these connections has important implications for sustainable development. For example, the United Nations' sustainable development goals, which all member states adopted in 2015, emphasize not only human-focused endeavors such as combating poverty and hunger and increasing health, well-being, and equality, but also

environment-focused goals such as climate action, clean water, and protecting biodiversity (United Nations Development Programme 2022). If SWB is found to be responsive to many of these considerations, then it could emerge as a useful indicator of sustainable development and could help policymakers better evaluate progress towards reaching sustainable development goals, as well as the possible trade-offs between these goals in the pursuit of mutual human and non-human thriving (Pradhan et al. 2017; Dietz 2015).

In this dissertation, I addressed the gaps in the research just described by examining the social and environmental influences on individual SWB. By environmental influences, I am referring to both positive experiences in the environment, such as spending time in nature, as well as negative experiences, such as living in a polluted environment. I conducted three distinct studies drawing upon samples at the state, national, and cross-national scale. However, the dependent variable(s) in all three of the studies corresponded with individual SWB. Three general research questions drove this dissertation. The first was "How does one's life experiences and position in the social structure influence one's SWB?". The second was "How do experiences with the biophysical environment influence one's SWB?". Finally, the third, which brings together the first two questions, was "Is SWB a potentially useful indicator of sustainable development?". Through this endeavor, I sought to bridge several areas of research and emphasize the value of SWB research in my core areas of study, sociology and the environmental social sciences.

Dissertation Outline

This dissertation is organized into five chapters, three of which I describe as "core chapters". The first chapter is this introduction. The core chapters consist of the middle three

chapters, each of which corresponds to one of the studies I conducted. In the first of these chapters, I present a study of the social drivers of SWB among adults living in U.S. State of Michigan. In doing so, I promote a sociology of SWB to better understand social inequalities, a core focus of sociological research. The second core chapter details a cross-national study of social and environmental influences on individual life satisfaction. Specially, I examined the role of several demographic variables, individuals' satisfaction with their local environment and the efforts of the countries they live in to protect it, as well as the stress countries are putting on the global environment measured by the carbon intensity of the national economy (the ratio of CO_2 emissions per dollar of GDP). For the third core chapter, I conducted a study with a sample of U.S. adults which explored how their cognitive identification with the natural world as well as the amount of time they spent outdoors was related to their SWB. While the previous two studies I described relied on secondary data sources, this third study drew upon original survey data collected by my advisor and I, in conjunction with a sampling and survey administration firm. In response to the well-documented lack of racial and ethnic diversity in research on the effect of the environment and nature on well-being (Gallegos-Riofrío et al. 2022), we employed a stratified sampling technique to ensure that racial and ethnic minorities were well-represented. In the final chapter of this dissertation, I summarize my general conclusions as well as discuss areas of SWB research I wish to pursue in the future.

Each of the core chapters were written with the intent, with limited revisions, to be submitted to peer-reviewed journals for eventual publication. In fact, at the time of writing this, one of these papers is already under review. It is my sincere hope that the work presented here, especially through its eventual publication in various outlets, will inspire more sociologists and

environmental scientists to engage in SWB research to help chart a course for a happier and more sustainable future.

REFERENCES

REFERENCES

Aitken, Andrew. 2019. “Measuring Welfare Beyond GDP.” *National Institute Economic Review* 249(1):R3-R16.

Anand, Paul. 2016. *Happiness, Well-Being and Human Development*. United Nations Development Programme. Retrieved May 28, 2021 (http://hdr.undp.org/en/content/happiness-well-being-and-human-development).

Brooks, Arthur C. 2008. *Gross National Happiness: Why Happiness Matters for America and How We Can Get More of It*. New York, NY: Basic Books.

Dasgupta, Partha. 2001. *Human Well-Being and the Natural Environment*. New York: Oxford University Press.

Diener, Ed., Richard E. Lucas, and Shigehiro Oishi. 2009. “Subjective Well-Being: The Science of Happiness and Life Satisfaction.” Pp. 63-73 in *The Oxford Handbook of Positive Psychology,* Second Edition, edited by S. J Lopez and C. R. Snyder. New York: Oxford University Press.

Diener, Ed, Richard E. Lucas, and Shigehiro Oishi. 2018. “Advances and Open Questions in the Science of Subjective Well-Being.” *Collabra: Psychology* 4(1):15.

Diener, Ed., Shigehiro Oishi, Richard E. Lucas. 2015. “National Accounts of Subjective Well-Being.” *American Psychologist* 70(3):234-242.

Dietz, Thomas. 2015. “Prolegomenon to a Structural Human Ecology of Human Well-Being.” *Sociology of Development* 1(1):123-148.

Gallegos-Riofrío, Carlos Andres, Hassan Arab, Amaya Carrasco-Torrontegui, and Rachelle K. Gould. 2022. “Chronic Deficiency of Diversity and Pluralism in Research on Nature’s Mental Health Effects: A Planetary Health Problem.” *Current Research in Environmental Sustainability* 4:100148.

Graham, Carol, Kate Laffan, and Sergio Pinto. 2018. “Well-Being in Metrics and Policy.” *Science* 362(6412): 287-288

Kesebir, Pelin, and Ed Diener. 2008. “In Pursuit of Happiness: Empirical Answers to Philosophical Questions.” Pp. 59-74 in *The Science of Well Being: The Collected Works of Ed Diener,* edited by E. Diener. Dordrecht, Switzerland: Springer.

Krueger, Alan B. 2009. *Measuring the Subjective Well-Being of Nations*. Chicago, IL: University of Chicago Press.

Organisation for Economic Co-operation and Development (OECD). 2013. *OECD Guidelines on Measuring Subjective Well-Being*. Paris, France: OECD Publishing.

Pradhan, Prajal, Luís Costa, Diego Rybski, Wolfgang Lucht, and Jürgen P. Kropp. 2017. "A Systematic Study of Sustainable Development Goal (SDG) Interactions." *Earth's Future* 5:1169-1179.

Stiglitz, Joseph E., Jean-Paul Fitoussi, and Martine Durand. 2019. *Measuring What Counts: The Global Movement for Well-Being*. New York: The New Press.

Stone, Arthur A., and Christopher Mackie. 2013. *Subjective Well-Being: Measuring Happiness, Suffering, and Other Dimensions of Experience*. National Research Council of the National Academies. Washington, DC: The National Academies Press.

United Nations Development Programme. 2022. "Sustainable Development Goals." Retrieved July 18, 2022. (https://www.undp.org/sustainable-development-goals).

Chapter 2:

Towards a Sociology of Subjective Well-Being: A New Perspective on Social Inequalities

Social inequalities are a core focus of sociological research. Substantial literatures examine inequalities in income and wealth, political influence, education, and physical health. However, social inequalities in subjective well-being (SWB) have not received much attention. SWB refers to peoples' evaluations of the quality of their lives as well as the presence and intensity of emotions they experience day-to-day (Diener, Lucas, and Oishi 2018). The current lack of sociological attention to SWB should be redressed for both theoretical and policy reasons. On theoretical grounds, it is plausible to argue that resources such as income or education are valuable because of their role in generating SWB and therefore, inequalities in such resources can produce inequalities in SWB (Dietz 2015). On policy grounds, long-standing dissatisfaction with standard economic metrics such as gross domestic product (GDP) and household income as indicators of societal and individual well-being have led to arguments for supplementing or even replacing these measures with SWB (Stiglitz, Fitoussi, and Durand 2019; Graham, Laffan, and Pinto 2018; Aitken 2019).

The methodology for measuring SWB is well established, and many nations have committed to routinely measuring and reporting it (Stone and Mackie 2013: Diener, Oishi, and Lucas 2015). However, most studies on SWB are based in psychology and economics. Only a small subset of studies draws extensively on sociological perspectives, which I believe is a missed opportunity as sociologists are well-suited to conduct research which examines the interplay between objective resources and subjective perceptions. Considering inequalities in SWB is important for, as the well-known Thomas theorem states, "if men define situations as real, they are real in their consequences (Thomas and Thomas 1928:527)". In other words,

peoples' lived experiences are reflected in subjective evaluations of their lives, rather than just objective conditions.

In this chapter, I promote a sociology of SWB in hopes of engaging more sociologists in this important work as well as emphasizing a new perspective in understanding social inequalities through the study of SWB. To do so, I present a study of how several social variables influenced individual SWB among a representative sample of residents of the U.S. State of Michigan. Specifically, I examined how these variables influenced three dimensions of individuals' SWB: general life satisfaction, positive affect, and negative affect. I also provided a particular focus on the role of financial satisfaction, which emerged as an especially robust predictor of SWB. Finally, I conclude by discussing how a sociology of SWB is essential to understand social inequalities that must be addressed as policymakers across the world are increasingly relying on SWB research.

Background

A large body of research examines the drivers of SWB. Most of this research relies on national and cross-national surveys which employ extensively tested standardized measures promoted by groups such as the Organisation for Economic Co-operation and Development (OECD 2013) and the National Research Council (Stone and Mackie 2013). These measures consist of Likert-scales which allow respondents to indicate their general life satisfaction as well as the presence and intensity of positive and negative emotions during a set time period, usually the previous day. They have been found to have strong cross-national reliability and converge well with alternative measures of well-being, such as interviewers' own ratings of respondents'

SWB, reports from family and friends, frequency of smiling, and measures of brain activity and hormones (Diener et al. 2018).

General life satisfaction refers to a cognitive dimension of SWB that corresponds with how a person evaluates the quality of their life. Meanwhile, the presence and intensity of recent emotions experienced by a person is often referred to as affective well-being. Scholars note that measuring these two dimensions of SWB separately is important as studies have found the factors which influence them, as well as what outcomes they themselves influence, are different (OECD 2013; Stone and Mackie 2013). Furthermore, research by Stone et al. (2010) and Bradburn (1969) found that positive and negative affect are substantially independent of each other and are not merely opposites, suggesting that they, too, should be examined separately.

One of the most studied topics is how SWB is affected by income. While it is often said that "money can't buy happiness", peoples' incomes are crucial in obtaining the monetary resources they need to ensure access to necessities such as housing and food, as well as leisure activities and good healthcare. As such, one would expect income to be a positive influence on SWB. The literature consistently finds this to be true, even when controlling for other demographic variables (Diener et al. 2018). The effects of income appear to be stronger on life satisfaction than on positive or negative affect (Kahneman and Deaton 2010). One point of debate is whether the positive effect of income on SWB reaches a "saturation point" where peoples' needs are largely met and further increases in income do not improve SWB. Some studies find such a point (Kahneman and Deaton 2010; Jebb et al. 2018), whereas others do not (Killingsworth 2020). Many studies have found that relative income, or how peoples' incomes compare to their peers', is a stronger predictor of SWB than absolute income (Alderson and Katz-Gerro 2016; Firebaugh and Tach 2012).

Recently, scholars are bringing increased attention to the influence of wealth on SWB, arguing that is a better indicator of social class than income, can buffer fluctuations in income, and is a stronger predictor of life outcomes (Brulé and Suter 2019). Data on wealth, however, is quite limited and complex relative to data on income and therefore, only a few studies have examined its effects on SWB (Pfeffer and Waitkus 2021). One way to possibly circumvent this limitation is by drawing upon national and cross-national surveys which measure financial satisfaction, which refers to individuals' subjective evaluations of their household's economic situation. Research on financial satisfaction is promising as it allows participants to consider both their income and wealth and express their own evaluations of each while also accounting for their feelings about how their financial situation compares to others' (Diego-Rosell, Tortora, and Bird 2018; Ngamaba 2020). Numerous cross-national studies have found financial satisfaction to be a robust predictor of SWB even when controlling for demographic variables such as household income (Lun and Bond 2016; Ngamaba 2020). In their study using data from the Gallup World Poll, Ng and Diener (2014) found that respondents with higher financial satisfaction demonstrated higher life satisfaction, more positive affect, and less negative affect.[1] However, they, along with others (Lun and Bond 2016; Hamoudi and Dowd 2014), emphasize that financial satisfaction appears to be a mediator between SWB and variables such as absolute income, age, gender, and education, suggesting future studies attempt to untangle these relationships.

Another prominent area of SWB research focuses on the effects of life circumstances such as employment status, relationship status, having children, and educational attainment. While one of the primary purposes of employment is to earn income, studies consistently find

[1] The authors found that the effect of financial satisfaction was stronger for life satisfaction than positive or negative affect, in agreement with much of the literature regarding the influence of absolute income on SWB.

that unemployed individuals demonstrate lower life satisfaction than the employed, even when controlling for income (Hastings and Roeser 2020; Diener et al. 2018). This suggests that being employed provides other benefits such as fostering a sense of purpose in one's life, helping a person to stay active, and upholding cultural norms regarding being a provider for one's family (Hoang and Knabe 2021; Clark, Kanbe, and Rätzel 2010). Findings regarding the influence of unemployment on affective well-being are mixed. While evidence suggests the unemployed can experience stress and depression due to their situation, they also appear to benefit from having more control over how they spend their time and thus, can typically spend more of it partaking in leisure activities rather than working (Hoang and Knabe 2021; Krueger and Mueller 2012; Dolan, Kurdna, and Stone 2017; Knabe et al. 2010).

Research finds that married individuals demonstrate higher life satisfaction and positive affect than single, divorced, or separated people (Wadsworth 2016; Diener et al. 2000). U.S. and cross-national studies tend to find either no effect or a negative effect of having children in the home on life satisfaction when controlling for income and marital status (Hansen 2012; Deaton and Stone 2014). A cross-national study by Stanca (2011) found that this negative relationship could largely be explained by the reduced financial satisfaction resulting from having more children to provide for. Regarding affective well-being, studies find parents tend to report both stronger positive and negative experienced emotions, such as happiness and joy as well as worry and depression (Nelson et al. 2013; Deaton and Stone 2014).

Some debate exists as to whether events such as becoming unemployed, getting married, or the birth of a child, have lasting effects on SWB or whether individuals will simply return to a "baseline", or "set-point" level of SWB well-being over time. Longitudinal studies are important in examining this question. While evidence of diminishing effects of SWB from these events has

been established (Luhmann and Intelisano 2018; Myrskylä and Margolis 2014; Lucas et al. 2003), other studies have found that their effects are often long lasting (Eberl et. al 2022; Grover and Helliwell 2019; Lucas 2007). This demonstrates that, in the case of cross-sectional research, it is appropriate to explore differences in SWB based on these variables.

Several studies have identified a positive relationship between educational attainment, usually measured by years of formal schooling, and SWB, especially life satisfaction, when controlling for income and other demographic variables (Kahneman and Deaton 2010; Blanchflower and Oswald 2004). These findings suggest that education provides benefits to people beyond the potentially higher incomes they earn because of the skills and credentials they obtained through their education. Research in the U.S. by Yakovlev and Leguizamon (2012) found that when controlling for income and health, obtaining a higher education was associated with higher scores on an aggregate SWB scale, which measured both life satisfaction and affect, whereas obtaining a secondary education was not.

Research on the relationship between age and life satisfaction generally identifies a "u-shaped" curve where life satisfaction is highest in early and late adulthood and reaches a low point in peoples' 40s (Blanchflower 2021; Diener et al. 2018). Some studies have found that life satisfaction again decreases in the last years of peoples' lives likely due to health challenges and loneliness (Baird, Lucas, and Donnellan 2010; Gerstorf et al. 2008). Longitudinal research in the U.S. by Yang (2008) identified age, period, and cohort effects on life satisfaction. They found that age exerted the strongest effects of the three. Stone et al. (2010), drawing from a large survey in the U.S., found the relationship between positive affect and age was similarly u-shaped. Regarding negative affect, they found that stress and anger declined from a high point in peoples' early 20s, while worry was elevated through middle age and then declined. In general,

however, research on the relationship between age and positive and negative affect is less developed than research on age and life satisfaction, the findings are mixed, and the effects are very small, making it difficult to make any clear conclusions (Pinquart 2001; Cheng 2004).

Sociologists may be especially interested in gender and racial inequalities in SWB as these are major areas of focus in our field. The findings regarding gender and SWB are mixed, as some studies have found no differences between men and women in life satisfaction while others have found either men or women had higher life satisfaction compared to their counterparts (Batz and Tay 2018). Results regarding gender and affective state are also mixed, although a recent cross-national study found women reported higher experienced positive and negative affect than men, as well as higher life satisfaction (Geerling and Diener 2020). Using time-series data from the General Social Survey from 1972 to 2004 and controlling for race, education, and age, Yang (2008) found that American women reported slightly higher average life satisfaction than American men but over time, these differences have disappeared. Generally, when gender differences in SWB are found, their effects are quite small (Diener et al. 2018).

The research on racial differences in SWB is very limited. A small number of studies in the U.S. find that Blacks and other non-white Americans demonstrated significantly lower life satisfaction than white Americans, even when controlling for factors such as age, income, and education, but also that this gap has narrowed over time (Iceland and Ludwig-Dehm 2019; Yang 2008). In a review of the state of knowledge on race and SWB, Yoo, Kim, and Lee (2018) emphasize the need for research that considers intersectionality, which feminists and critical race scholars describe as the ways in which multiple systems of oppression, such as racism and sexism, are interconnected and therefore should not be examined separately (Crenshaw 1991; Cole 2009). Theories of intersectionality emphasize the value in exploring interaction effects

when examining the drivers of social inequalities, including social inequalities in SWB. There is much more to learn about racial and gender disparities in SWB and this is an area where sociologists could make substantial contributions to the field.

The relationship between religion and SWB is also worth considering because religions contribute to the way individuals define and understand well-being, as well as envision what happens to oneself after death (Newman and Graham 2018). The research finds partaking in religious activities is associated with higher life satisfaction, higher positive affect, and lower negative affect (Diener, Tay, and Myers 2011; Graham and Haidt 2010; Smith, McCullough, and Poll 2003). However, as Pargament (2002) notes, there are many potential mediators of this relationship. Does religion improve SWB because of the sense of meaning it instills in life? Or could it be that it fosters a sense of community or that religious beliefs can dampen the negative effects of difficult life circumstances? In a cross-national study, Diener et al. (2011) found that religious individuals in more religious countries demonstrated higher SWB than nonreligious individuals, but this relationship was not observed in less religious countries. This finding suggests that being religious helps individuals feel like they "fit in", particularly if they follow the dominant belief system, which may in part account for higher levels of SWB.

Finally, some research suggests that individuals' perceptions of institutions influence their SWB. For example, in a longitudinal study using data from 15 European nations, Hudson (2006) found a positive relationship between trust in the EU government, respondents' national governments, the UN, and the European Central Bank and individual life satisfaction. Cross-national studies also identify the "happiest" nations as those with relatively high levels of trust in national institutions (Easterlin 2013). Research on this area, however, is limited, providing sociologists an intriguing opportunity to examine it further.

The research just discussed encompasses numerous areas of interest to sociologists. Yet, few studies in our field engage with SWB. In this study, I consider many of the variables just mentioned to examine social inequalities in SWB and what influences them. By doing so, I hope to bring more attention to SWB research and future avenues of research for sociologists.

Data and Methods

Data were from the winter 2015 installment of the State of the State Survey, an approximately biannual public opinion survey of adults living in Michigan that has been administered since 1994 by Michigan State University's Institute for Public Policy and Social Research (IPPSR 2022). The survey samples both landline and celluar phone numbers across the state and is conducted through computer assisted telephone interviewing where trained interviewers assist respondents in completing the survey over the phone (Pierce 2015). The winter 2015 survey was unique in that it included six SWB questions based upon OECD (2013) guidelines. These items are widely considered to be the most standard and well-developed measures of SWB, are supported by a substantial literature, and are used in many large cross-national surveys.

A total of 966 interviews were completed (498 landline, 468 cellular) yielding a 22.5% response rate. The contact rate was 66.8% and the average interview lasted 22 minutes. Survey weights were developed to adjust for both the split-sample approach and so that the data were representative (within 1.1% of the actual values) of the State of Michigan in terms of gender, race, and age based upon 2009-2013 American Community Survey data (U.S. Census Bureau 2013; Pierce 2015).

Dependent Variables

The dependent variables consisted of the six SWB questions, which are listed in Table 2.1 in the order they were asked in the survey. The first question was a measure of overall life satisfaction in which respondents were asked how satisfied they were "with life as a whole these days" on a scale from zero to ten where zero implied "not satisfied at all" and ten implied "completely satisfied". The second question assessed the extent to which respondents felt their life was worthwhile on a scale from zero to ten where zero implied "not at all worthwhile" and ten implied "completely worthwhile". The next three questions were measures which assessed the presence and intensity of recent emotional states. Respondents were asked to indicate on a scale from zero to ten how often they felt each emotion the previous day, where zero implied "not at all" and ten implied "all the time". The three emotions were "happy", "worried", and "depressed". The final question was Cantril's ladder (Cantril 1965), a commonly used measure of life satisfaction. Respondents were asked to "imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you." They were then asked to state which step they thought they stood on at the time of the interview.

Table 2.1: Subjective Well-Being Questions

First, I'd like to ask you a few questions about how you're feeling these days.

1. *On a scale from zero to ten, where zero means you feel not satisfied at all and ten means you feel completely satisfied, overall, how satisfied are you with life as a whole these days?*

2. *On a scale from zero to ten, where zero means you feel the things you do in your life are not at all worthwhile, and ten means they are completely worthwhile, overall, to what extent do you feel the things you do in your life are worthwhile?*

Next, I will read out a list of ways you might have felt yesterday. For each feeling, answer on a scale from zero to ten, where zero means you did not experience the feeling at all yesterday and ten means you experienced the feeling all the time yesterday.

3. *How happy did you feel yesterday?*

4. *How worried did you feel yesterday?*

5. *How depressed did you feel yesterday?*

Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you.

6. *On which step of the ladder would you say you personally feel you stand at this time?*

Source: IPPSR (2015), OECD (2013)

Independent Variables

The independent variables consisted of several notable influences on SWB identified in the literature review. Annual household income was measured categorically, ranging from "less than $20,000" to "$100,000 or more". Due to a substantial number of respondents who refused to disclose their income (N=74), I created an additional "missing/refused" category to prevent significant data loss when conducting listwise deletion. Respondents were also asked to rate their current household financial situation on a five-point Likert scale ranging from "poor" to "excellent". This measure was included to account for respondents' subjective perceptions of their economic situation, such as how their income compares to their peers', as well as their evaluations of other resources such as their wealth.

Respondents reported whether they worked full-time, worked part-time, were unemployed or disabled, or not in the labor force. I combined those who reported being unemployed or disabled into one category because the number of individuals who identified as each was relatively small (N=27 and 41, respectively) and because some initial analysis suggested that both statuses were associated with similarly lower levels of SWB, which is supported by the research literature, as well (Lucas 2007). For marital status, I noted whether respondents were single, married, divorced or separated, or widowed. I also noted whether respondents had children under 18 living in their household. For education, respondents were identified as having the equivalent of a high school education or less, some college or technical school training, a four-year college degree, or a graduate degree. Age was measured categorically, ranging from "18 to 29" to "60 and older". As with income, I created a "missing/refused" category for the many respondents who did not disclose their age (N=56).

I answered Yoo et al.'s (2018) call to incorporate intersectionality into SWB research by combining the race and gender measures. Most respondents identified as either white or Black/African American, a reflection of the population of the state of Michigan (U.S. Census 2013). Very few respondents reported identifying as another race and therefore, they were not included in the analysis. Like the U.S. Census, the survey asked respondents whether they were of Hispanic/Latinx origin separately from their race. As such, Hispanic/Latinx respondents, of which there were 34, were included among the white and Black respondents depending on whether they reported being white and Hispanic/Latinx or Black and Hispanic/Latinx. This resulted in four race/gender categories: white males, white females, Black males, and Black females.

A vast majority of respondents identified as belonging to a Christian faith. While several other religions were mentioned, none of them had enough adherents in the sample to be included as its own category in the analysis. I therefore differentiated between respondents who identified as Christian and those who did not.[2] My rationale for doing so is being Christian represents being a part of the predominant religion in the study population. Finally, respondents were asked how often they felt they could trust the federal government, with responses ranging on a 4-point scale from "almost never" to "nearly always or most of the time."

Sample Characteristics

I used listwise deletion to remove cases with missing data for any of the dependent and independent variables. This resulted in the loss of 131 cases (13.5%) and a final sample of 835 individuals. Of the deleted cases, 41 were removed because the respondents did not identify as white or Black. While I acknowledge that it is valuable to include individuals of diverse ethnic groups, there were not enough people of other races in the sample to create additional intersectional race/gender categories. The remainder of the missing cases appeared random and did not exhibit any patterns that would bias the data.

Tables 2.2 and 2.3 display the final weighted sample characteristics. Table 2.2 displays the descriptive statistics for the continuous variables, including the dependent variables. Respondents reported a mean life satisfaction score of 7.65 (all SWB variables are out of a possible 10), a mean life worthwhile score of 8.22, a mean happiness score of 7.60, a mean worried score of 3.17, a mean depressed score of 1.74, and mean Cantril's ladder score of 7.33. Respondents reported a mean financial situation score of 3.66 (out of 5, with 5 signifying an

[2] Non-Christians included those who identified as atheist, agnostic, or non-religious.

excellent financial situation) and the mean trust in the federal government was 2.51 (out of 4, with 4 indicating trusting the federal government "nearly always").

Table 2.2: Descriptive Statistics for Continuous Variables

	Mean	*Median*	*Std. Dev.*
Life satisfaction (0-10, where 10 is completed satisfied)	7.65	8	1.78
Life worthwhile (0-10, where 10 is completely worthwhile)	8.22	8	1.67
Happy yesterday (0-10, where 10 is all the time)	7.60	8	2.05
Worried yesterday (0-10, where 10 is all the time)	3.17	2	2.94
Depressed yesterday (0-10, where 10 is all the time)	1.80	0	2.75
Cantril's ladder (0-10, where 10 is best possible life)	7.33	8	1.78
Financial situation (0-5, where 5 is excellent)	3.66	4	0.95
Trust in federal government (0-4, where 4 is nearly always)	2.51	3	0.95

N=835; Source: IPPSR (2015)

Table 2.3 shows the descriptive statistics for the categorical variables. About 20 percent of respondents reported an annual household income of $100,000 or more, while 14.1 percent reported an income of $70,000 to $99,999, 19.9 percent $50,000 to $69,999, 28.4 percent $20,000 to $49,999, and 12.3 percent reported an income below $20,000. Just over five percent of respondents refused to disclose their income. Around 38 percent of respondents were employed full-time, 13.8 percent part-time, and 5.6 of respondents were either unemployed or disabled. Nearly 42 percent of respondents were not in the labor force, which included retirees, full-time homemakers, and full-time students. A slight majority of respondents were married (53.9%), while 24 percent were single, about 11 percent were divorced or separated, and 11.5 percent were widowed. Most respondents (77.6%) did not report children under 18 in their households.

About 25 percent of respondents held a high school education or less, 31.6 percent had attended a technical school or had some college education, 27 percent reported having a four-year college degree, and 16.2 percent had graduate degrees. The largest age group was 60 and up, which accounted for just under 40 percent of respondents, followed by 50-59 (23.1%), 40-49 (12.5%), 18-29 (12.1%), and 30-39 (9.1%). A small portion of individuals (3.6%) refused to disclose their age. Most respondents (47.9%) identified as white males, followed by white females (43%), Black females (5.4%), and Black males (3.8%). Finally, a substantial majority of respondents (79.9%) reported being Christian.

Table 2.3: Descriptive Statistics for Categorical Variables

	Frequency	*Percentage*		*Frequency*	*Percentage*
Income			Education		
Less than $20,000	103	12.3	High school or less	211	25.3
$20,000 to $49,999	237	28.4	Technical school /some college	264	31.6
$50,000 to $69,999	166	19.9	Four-year degree	225	27.0
$70,000 to $99,999	118	14.1	Graduate degree	135	16.2
$100,000 or more	168	20.1	Age		
Missing or refused	43	5.2	18-29	101	12.1
Employment status			30-39	76	9.1
Employed full-time	320	38.3	40-49	104	12.5
Employed part-time	115	13.8	50-59	193	23.1
Unemployed or disabled	47	5.6	60 and up	331	39.6
Not in the labor force	350	41.9	Missing or refused	30	3.6
Relationship status			Race/gender		
Single	200	24.0	White male	400	47.9
Married	450	53.9	White female	359	43.0
Divorced or separated	89	10.7	Black male	32	3.8
Widowed	96	11.5	Black female	45	5.4
Children in household			Christian		
Yes	187	22.4	Yes	667	79.9
No	648	77.6	No	168	20.1

N=835; Source: IPPSR (2015)

Scaling and Analysis

I conducted an exploratory factor analysis and principal component analysis to identify the dimensions of SWB represented among the 6 SWB variables. Results suggested the presence of three factors which together accounted for 78 percent of variance in the data. The first factor, which I henceforth call life satisfaction, consisted of questions 1, 2, and 6 in Table 2.1. These questions referred to respondents' life satisfaction, the extent they found life worthwhile, and

Cantril's ladder. The second factor corresponded with positive affect, which consisted solely of respondents' experienced happiness the previous day. The third factor referred to negative affect, which was a combination of how worried and depressed respondents reported feeling the previous day.[3] Based on these findings, I created life satisfaction and negative affect scales and proceeded with the analysis using the three dimensions. This approach agrees with an extensive literature which emphasizes life satisfaction and affect as distinct dimensions of SWB (Diener et al. 2018; Stone et al 2010; Bradburn 1969).

I then employed ordinary least squares (OLS) regression to regress the three SWB dimensions on the independent variables. I also ran a fourth model which regressed financial satisfaction on the other independent variables, as financial satisfaction emerged as a notable influence on SWB. My analysis was conducted using the "svy:reg" command in Stata SE version 16.1 (StataCorp 2019). This command facilitates OLS regression for complex survey data which includes survey weights. Diagnostic tests for multicollinearity did not reveal serious issues. The mean variance inflation factor for the models was 1.95. I also ran models for each of the six SWB variables independently, for which the results are displayed in the appendix (Table 2.6), as is a correlation matrix including Pearson's correlation coefficients between all dependent and independent variables (Table 2.5).

Results and Discussion

Table 2.4 displays the OLS regression results. While studies consistently find a positive association between income and SWB, I did not find any significant effect of income on any of

[3] The life satisfaction scale had a Cronbach's alpha of 0.79, with factor loadings of 0.67 (life satisfaction), 0.76 (life worthwhile), and 0.73 (Cantril's ladder). The negative affect scale had a Cronbach's alpha of 0.70 with factor loadings of 0.66 (depressed yesterday) and 0.69 (worried yesterday).

the SWB dimensions when controlling for the other independent variables. Financial satisfaction, on the other hand, emerged as robust influence on all three dimensions. Specifically, respondents with higher financial satisfaction reported higher life satisfaction, more positive affect, and less negative affect. This supports the assertation by some scholars that the relationship between income and SWB is mediated by financial satisfaction, which is influenced by income but also a variety of other social structural variables (Ng and Diener 2014; Lun and Bond 2016; Hamoudi and Dowd 2014). In order to examine what some of these influences might be, as well as the mediating role of financial satisfaction in the relationship between income and SWB, an additional model was run to estimate the effects of the other independent variables on financial satisfaction. This model is discussed at the end of this section.

Consistent with previous work, I observed disparities in SWB based upon employment status. Specifically, those who were unemployed or disabled demonstrated significantly lower life satisfaction as well as higher negative affect than those employed full-time, controlling for the other variables. Employment status did not emerge as a significant influence on positive affect. Those employed part-time or not in the labor force had similar levels of SWB as those employed full-time.

Marital status emerged as an influence on life satisfaction, but not on positive or negative affect. Those who were married reported higher life satisfaction than single respondents. Interestingly, divorced or separated respondents also reported higher life satisfaction than single respondents. Having children under 18 in the household was not significantly associated with any of the SWB dimensions, nor was respondents' educational attainment, when controlling for the other variables. It is possible, as some studies have found, that there are indirect positive

effects of education on SWB through variables such as income and employment status, as education can help individuals in their career tracks (Helliwell 2003).

Age did not generally influence SWB, with one exception: individuals aged 40-49 demonstrated less negative affect than those aged 18-29. When examining the models for each individual SWB measure (see appendix), it appears this effect is largely explained by lower levels of worry among the middle-aged adults, a finding that contrasts with Stone et al.'s (2010) study which found worry peaked mid-life and then declined. Instead, I found that the relationship between age and worry could be described as u-shaped. There was also one significant finding among the race/gender categories, that white women demonstrated higher negative affect than white men. Otherwise, I did not observe significant differences in SWB among these categories.

Individuals who identified as Christian demonstrated higher life satisfaction than non-Christians. There are two probable explanations for this. One is that this is largely a result of feeling a sense of belonging and community as Christianity is the predominant religion in the U.S. However, this finding could also reflect some of the potential benefits of religious beliefs, such as helping people find a sense of purpose in life, belief in an afterlife, and drawing upon faith to persevere through difficult life circumstances (Pargament 2002). Considering that most of the non-Christian respondents identified as non-religious, atheist, or agnostic (N=132 out of 168), the comparison made in this study could also be viewed as being religious compared to non-religious. Finally, individuals who reported higher trust in the federal government had higher life satisfaction, a finding which agrees with some cross-national research (Hudson 2006).

Table 2.4: OLS Regression Results for SWB Scales

	Life Satisfaction	Positive Affect	Negative Affect	Financial Satisfaction
Intercept	4.704 (0.339)***	5.522 (0.588)***	5.832 (0.730)***	2.561 (0.178)***
Income (vs. less than $20k)				
$20,000-$49,999	0.348 (0.228)	0.054 (0.390)	-0.396 (0.414)	0.634 (0.137)***
$50,000-$69,999	0.188 (0.246)	0.185 (0.450)	-0.446 (0.429)	1.015 (0.150)***
$70,000-$99,999	0.398 (0.248)	-0.305 (0.437)	-0.027 (0.452)	1.067 (0.157)***
$100,000 or more	0.394 (0.265)	-0.087 (0.485)	0.075 (0.484)	1.485 (0.157)***
Missing or refused	0.385 (0.284)	0.330 (0.499)	-0.578 (0.569)	0.793 (0.207)***
Financial satisfaction	0.477 (0.071)***	0.429 (0.121)***	-0.733 (0.147)**	---
Employment (vs. full-time)				
Employed part-time	0.197 (0.154)	0.278 (0.277)	0.194 (0.291)	-0.141 (0.094)
Unemployed or disabled	-0.738 (0.232)**	-0.243 (0.408)	1.488 (0.509)**	-0.354 (0.169)*
Not in labor force	-0.085 (0.149)	0.129 (0.248)	0.406 (0.278)	0.025 (0.087)
Marital status (vs. single)				
Married	0.531 (0.150)***	-0.081 (0.322)	-0.052 (0.317)	0.097 (0.089)
Divorced or separated	0.553 (0.225)*	-0.317 (0.384)	-0.071 (0.442)	0.165 (0.141)
Widowed	0.300 (0.221)	-0.195 (0.382)	0.385 (0.490)	0.104 (0.156)
Children in household	-0.184 (0.140)	-0.105 (0.239)	-0.057 (0.273)	-0.154 (0.089)
Education (vs. high school or less)				
Some college/tech sch.	-0.102 (0.150)	-0.091 (0.265)	-0.423 (0.302)	-0.171 (0.095)
Four-year degree	0.020 (0.149)	-0.051 (0.271)	-0.002 (0.298)	-0.105 (0.097)
Graduate degree	-0.026 (0.164)	-0.134 (0.280)	-0.352 (0.319)	-0.053 (0.118)
Age (vs. 18-29)				
30-39	0.384 (0.198)	-0.088 (0.428)	-0.667 (0.406)	-0.148 (0.129)
40-49	-0.124 (0.207)	0.289 (0.372)	-0.824 (0.392)*	-0.303 (0.118)*
50-59	-0.155 (0.192)	0.061 (0.364)	-0.070 (0.396)	-0.326 (0.115)**
60 and older	0.176 (0.213)	0.655 (0.377)	-0.367 (0.417)	0.035 (0.111)
Missing or refused	-0.147 (0.317)	-0.731 (0.450)	0.078 (0.607)	-0.522 (0.181)**
Race/Gender (vs. white male)				
White female	0.188 (0.106)	0.043 (0.200)	0.454 (0.206)*	0.109 (0.063)
Black male	-0.366 (0.321)	-0.055 (0.420)	-0.326 (0.482)	-0.036 (0.139)
Black female	0.279 (0.201)	-0.108 (0.426)	-0.051 (0.447)	-0.319 (0.165)
Christian	0.337 (0.138)*	0.244 (0.211)	-0.140 (0.243)	0.110 (0.075)
Trust in federal government	0.145 (0.056)*	0.050 (0.107)	-0.116 (0.109)	0.117 (0.034)
R^2	0.288	0.093	0.140	0.335

N=835; Unstandardized regression coefficients (standard error); *p<.05 **p<.01 ***p<.001
Source: IPPSR (2015)

Influences on Financial Satisfaction

The finding that financial satisfaction was a robust predictor of all three SWB dimensions warrants further attention. This includes examining the mediating effect of financial satisfaction on the relationship between income and SWB, as well as how the other independent variables are associated with financial satisfaction. To no surprise, I observed a positive influence of income on financial satisfaction, with increasing effect sizes at higher incomes. I did not observe a threshold at which higher income did not result in a further increase in financial satisfaction compared to those making less than $20,000 annually. Note that while the missing and refused income category was also significant, this is difficult to interpret as I do not have any information on these respondents' income. These findings demonstrate that financial satisfaction indeed is a mediator between income and SWB.

I also found that those who were unemployed or disabled reported lower financial satisfaction than those working full-time, even when controlling for income and the other independent variables. Age emerged as a significant predictor of financial satisfaction, as well, as middle-aged respondents (40-49 and 50-59) reported lower financial satisfaction than those aged 18-29. One possible explanation for this finding, based on research by Firebaugh and Tach (2012), is that Americans tend to compare their incomes most intensely with those who are closest to them in age and such comparison is especially intense approaching retirement-age, when individuals' incomes are generally their highest.

Conclusion

For over a century, sociologists have been examining social inequalities and what drives them. Yet, few have explored inequalities in SWB. Due to the increasing global interest in SWB

as an indicator of well-being, it is now time for a sociology of SWB. SWB is noteworthy as it allows individuals to say for themselves how their lives are going, rather than relying on objective economic indicators (Diener et al. 2009). By studying SWB and inequalities in it, we can understand how people perceive the quality of their own lives and the many factors which influence these perceptions. Drawing upon the classic Thomas theorem (Thomas and Thomas 1928), I emphasize that sociologists are well suited to understand the interplay between objective conditions and subjective perceptions, which is central to SWB research. Furthermore, studying SWB could help sociologists better understand the experienced effects of economic, racial/ethnic, and gender inequalities, among others, on individuals.

In this study, I examined how three dimensions of SWB among residents of the U.S. state of Michigan were influenced by a variety of variables identified in the literature as drivers of SWB. The most notable finding was the robust effect of respondents' financial satisfaction. Those with higher financial satisfaction reported higher life satisfaction, higher positive affect, and lower negative affect. When controlling for financial satisfaction, household income was not a significant predictor of any of the SWB dimensions. However, further analysis demonstrated that financial satisfaction mediated the relationship between household income and SWB. It is important to note that other factors besides income influenced financial satisfaction, including age and employment status. Some other variables which emerged as significant predictors of SWB included employment status, marital status, and age.

The combination of sociologists' long-standing interest in race and gender inequalities and the current lack for research on disparities in SWB based on race and gender presents a potential ripe area for future research. Following Yoo et al.'s (2018) call for research which accounts for intersectional identities, I examined how SWB varied across four race/gender

categories that corresponded with white males, white females, Black males, and Black females. The only significant effect I observed was white women reported higher negative affect than white males. However, the data used in this study was very limited as the sample was overwhelmingly white, had just enough Black respondents to justify the inclusion of the Black male and Black female categories, and did not have enough respondents identifying as other races to be included in the analysis. Future studies should build upon this work by drawing upon samples that are more racially and ethnically diverse. Stratified sampling techniques which would ensure sufficient numbers of members of various racial/ethnic groups would be useful in such endeavors, as well as relying on large national and cross-national datasets.

This study also found that Christians demonstrated higher life satisfaction than non-Christians, but it is unclear if this is because of characteristics of Christian faith, the benefits of being religious in general, or simply because being Christian in a nation where most other people identify as Christian helps one to fit in. Future studies should examine more religiously diverse samples. Few studies, if any, have looked specifically into differences in SWB across different religious groups, including the numerous denominations of Christianity, so this is a potentially promising area of inquiry. The finding that those who demonstrated higher trust in the federal government reported higher life satisfaction is also noteworthy. While some scholars have emphasized that trust in institutions contributes to higher SWB (Easterlin 2013), the empirical evidence regarding the effect of trust in government on SWB is surprisingly limited and presents an interesting avenue to explore.

One of the main limitations of this study is that it focused on how individual characteristics affected respondents' SWB. As sociologists, we know well that context matters. Future studies should examine how local, national, and even global factors influence individual

SWB. For example, while many studies have found that unemployment negatively affects SWB, some have also found that the local employment rate influences SWB, as well, even when controlling for individual employment status (Clark, Knabe, and Rätzel 2010). Studies on how trust in government contributes to SWB could take note of trust in various levels of government, including local, state, and national. Furthermore, studies across several states as well as cross-national studies could employ multi-level regression techniques which account for variation in SWB accounted for by state or country. Such techniques also allow for accurate estimates of the effects of both individual and state or country-level variables on SWB. In the next chapter, I present a cross-national study which incorporates many of the suggestions just presented.

Finally, any cross-sectional study that attempts to identify influences on SWB is limited in that the evidence of causality is lacking compared to longitudinal studies. This is especially important to note as numerous studies have found that while there are many social factors which appear to affect SWB, SWB is known to influence many life outcomes. For example, research has found that individuals with higher SWB are more likely to marry and stay married (Lucas et al. 2003; Luhmann et al. 2013), while individuals with lower SWB are more likely to become unemployed (Frey and Stutzer 2002). While I used terms such as "influenced" and "affected" throughout this chapter for purposes of developing theory, I also acknowledge that these phrases should be interpreted with caution in cross-sectional research.

This study demonstrated the effect of numerous social variables on respondents SWB, as well as identified some promising paths for future research. It is my hope that this chapter serves a call to other sociologists to engage in SWB research to both better understand how social inequalities are experienced as well as to bring sociological perspectives into the growing international conversation around SWB.

APPENDIX

APPENDIX

Table 2.5: Correlation Coefficients Between Dependent and Independent Variables

	Life satis.	Pos. affect	Neg. affect	Income2*	Income3*	Income4*	Income5*	Income (miss.)	Financial Satis.	Emp. part-time	Unemp/disabled	Not in labor force	Married	Div/sep.	Widow	Children in h.h.	Some Col/tech.
Life satis.	1.00																
Pos. affect	0.49	1.00															
Neg. affect	-0.32	-0.33	1.00														
Income2*	0.01	0.03	0.03	1.00													
Income3*	-0.02	0.04	-0.05	-0.31	1.00												
Income4*	0.07	-0.05	0.01	-0.26	-0.20	1.00											
Income5*	0.15	0.04	-0.09	-0.32	-0.25	-0.20	1.00										
Income (miss.)	0.01	0.03	-0.04	-0.15	-0.12	-0.09	-0.12	1.00									
Financial satis.	0.43	0.20	-0.26	-0.13	0.06	0.09	0.31	0.01	1.00								
Emp. part-time	0.02	0.02	-0.02	-0.05	-0.01	-0.02	0.05	-0.01	-0.06	1.00							
Unemp/disabled	-0.20	-0.12	0.14	-0.02	-0.07	-0.05	-0.08	0.08	-0.19	-0.10	1.00						
Not in labor force	0.10	0.12	0.04	0.11	0.06	-0.05	-0.17	0.04	-0.10	-0.34	-0.21	1.00					
Married	0.20	0.09	-0.10	-0.17	0.06	0.09	0.28	0.02	0.20	-0.05	-0.11	0.06	1.00				
Div/Sep.	-0.04	-0.07	0.02	0.08	-0.04	-0.08	-0.12	-0.06	-0.09	0.01	0.15	-0.03	-0.37	1.00			
Widow	0.04	0.04	0.05	0.08	-0.01	-0.05	-0.11	0.03	0.06	-0.09	-0.06	0.28	-0.39	-0.12	1.00		
Children in h.h.	-0.05	-0.11	-0.02	-0.12	-0.05	0.09	0.12	0.00	-0.06	0.06	0.01	-0.25	0.11	-0.02	-0.16	1.00	
Some col/tech.	-0.08	-0.07	0.02	0.02	0.00	0.03	-0.09	0.02	-0.13	0.01	0.01	0.02	0.01	0.03	-0.01	0.01	1.00
Col. degree	0.10	0.04	-0.04	-0.08	0.11	0.01	0.12	-0.06	0.12	0.01	-0.07	-0.08	0.05	-0.03	-0.06	-0.02	-0.41
Grad/profess.	0.11	0.05	-0.09	-0.11	-0.04	0.00	0.23	0.07	0.16	0.02	-0.08	0.02	0.13	-0.06	0.04	-0.02	-0.30
Age2*	0.02	-0.08	-0.06	-0.04	-0.02	0.10	0.04	-0.07	-0.03	0.02	0.01	-0.22	0.05	0.01	-0.11	0.41	0.01
Age3*	-0.07	-0.05	-0.05	-0.09	-0.10	0.04	0.13	-0.02	-0.07	-0.02	0.07	-0.20	0.01	0.09	-0.11	0.20	0.02
Age4*	-0.05	-0.07	0.06	-0.08	0.03	0.05	0.02	-0.02	-0.03	0.01	0.06	-0.15	0.17	-0.02	-0.07	-0.13	0.02
Age5*	0.18	0.19	-0.01	0.13	0.02	-0.10	-0.04	0.04	0.18	-0.12	-0.10	0.57	0.06	0.01	0.32	-0.35	-0.05
Age (missing)	-0.06	-0.07	0.02	0.04	0.00	-0.02	-0.03	-0.02	-0.09	0.18	-0.05	-0.06	-0.18	-0.03	-0.07	0.04	0.01
W. female	0.94	0.05	0.06	0.08	-0.02	-0.01	-0.06	0.01	0.04	0.08	-0.09	0.15	-0.05	0.03	0.16	-0.01	0.01
B. male	-0.10	-0.02	0.00	-0.04	-0.02	-0.03	-0.01	0.01	-0.08	-0.01	0.01	-0.07	-0.13	-0.05	0.01	0.00	0.03
B. female	-0.01	-0.01	0.01	0.05	0.01	-0.08	-0.09	0.02	-0.16	0.01	0.03	0.03	-0.14	0.11	0.03	0.00	0.03
Christian	0.15	0.10	-0.01	0.00	0.00	0.04	0.00	-0.03	0.05	-0.02	-0.10	0.09	0.02	0.00	0.08	-0.07	0.05
Trust gov.	0.13	0.00	-0.03	0.12	-0.03	-0.03	0.00	-0.04	0.10	0.05	-0.02	-0.01	-0.04	0.06	0.03	0.00	-0.06

Figures refer to Pearson's correlation coefficients

*Income2 = $20,000 to $49,999; Income3 = $50,000 to $69,999 , Income4 = $70,000 to $99,999, Income5 = $100,000 or more

*Age2 = 30-39, Age3 = 40-49, Age4 = 50-59, Age5 = 60 and older; Source: IPPSR (2015)

Table 2.5 (cont'd)

	Col. degree	Grad/profess.	Age2*	Age3*	Age4*	Age5*	Age (missing)	W. female	B. male	B. female	Christian	Trust gov.
Col. degree	1.00											
Grad/profess.	-0.27	1.00										
Age2*	0.02	-0.04	1.00									
Age3*	-0.02	0.00	-0.12	1.00								
Age4*	-0.03	0.03	-0.17	-0.21	1.00							
Age5*	0.00	0.10	-0.26	-0.31	-0.44	1.00						
Age (missing)	-0.07	-0.07	-0.06	-0.07	-0.11	-0.16	1.00					
W. female	-0.01	0.00	-0.02	-0.03	-0.01	0.07	0.03	1.00				
B. male	-0.05	-0.04	-0.02	0.06	-0.02	-0.07	0.06	-0.17	1.00			
B. female	-0.04	0.02	0.00	-0.01	-0.03	0.00	-0.02	-0.19	-0.05	1.00		
Christian	-0.09	0.03	-0.09	0.03	0.05	0.07	0.02	0.01	0.04	0.07	1.00	
Trust gov.	-0.04	0.11	-0.07	-0.02	0.03	0.01	0.07	0.06	-0.04	0.10	0.02	1.00

Figures refer to Pearson's correlation coefficients

*Income2 = $20,000 to $49,999; Income3 = $50,000 to $69,999, Income4 = $70,000 to $99,999, Income5 = $100,000 or more

*Age2 = 30-39, Age3 = 40-49, Age4 = 50-59, Age5 = 60 and older; Source: IPPSR (2015)

Table 2.6: OLS Regression Results for All SWB Variables

	Life satisfaction	Life worthwhile	Cantril's Ladder	Happy yesterday	Worried yesterday	Depressed yester.
Intercept	4.959 (0.396)***	5.659 (0.420)***	3.494 (0.505)***	5.522 (0.588)***	6.511 (0.806)***	5.154 (0.802)***
Income (vs. less than $20k)						
$20,000-$49,999	0.410 (0.264)	0.256 (0.302)	0.380 (0.296)	0.054 (0.390)	-0.654 (0.507)	-0.138 (0.424)
$50,000-$69,999	0.134 (0.292)	0.136 (0.324)	0.294 (0.331)	0.185 (0.450)	-0.850 (0.522)	-0.042 (0.437)
$70,000-$99,999	0.550 (0.302)	0.169 (0.326)	0.474 (0.324)	-0.305 (0.437)	-0.113 (0.560)	0.059 (0.468)
$100,000 or more	0.543 (0.311)	0.073 (0.359)	0.567 (0.327)	-0.087 (0.485)	-0.313 (0.582)	0.463 (0.511)
Missing or refused	0.650 (0.379)	0.208 (0.343)	0.296 (0.348)	0.330 (0.499)	-0.968 (0.640)	-0.189 (0.607)
Financial satisfaction	0.457 (0.080)***	0.349 (0.086)***	0.626 (0.108)***	0.429 (0.121)***	-0.667 (0.165)***	-0.798 (0.156)***
Employment (vs. full-time)						
Employed part-time	0.011 (0.170)	0.299 (0.213)	0.282 (0.213)	0.278 (0.277)	0.122 (0.354)	0.266 (0.313)
Unemployed or disabled	-0.806 (0.290)**	-0.769 (0.312)*	-0.639 (0.362)	-0.243 (0.408)	1.018 (0.568)	1.958 (0.527)***
Not in labor force	-0.021 (0.180)	-0.236 (0.194)	0.001 (0.187)	0.129 (0.248)	-0.047 (0.321)	0.859 (0.309)**
Marital status (vs. single)						
Married	0.427 (0.179)*	0.557 (0.201)**	0.606 (0.189)**	-0.081 (0.322)	0.102 (0.379)	-0.205 (0.340)
Divorced or separated	0.435 (0.252)	0.585 (0.296)*	0.638 (0.366)	-0.317 (0.384)	0.016 (0.520)	-0.159 (0.470)
Widowed	-0.038 (0.283)	0.572 (0.261)*	0.368 (0.291)	-0.195 (0.382)	0.268 (0.546)	0.501 (0.515)
Children in household	-0.267 (0.161)	-0.091 (0.185)	-0.194 (0.194)	-0.105 (0.239)	0.089 (0.325)	-0.204 (0.305)
Education (vs. high school or less)						
Some college/tech school	-0.074 (0.173)	-0.082 (0.191)	-0.150 (0.206)	-0.091 (0.265)	-0.147 (0.349)	-0.699 (0.318)*
Four-year degree	0.096 (0.175)	-0.057 (0.185)	0.021 (0.196)	-0.051(0.271)	0.231 (0.347)	-0.235 (0.323)
Graduate degree	-0.030 (0.196)	-0.034 (0.197)	-0.015 (0.228)	-0.134 (0.280)	-0.175 (0.403)	-0.529 (0.334)
Age (vs. 18-29)						
30-39	0.309 (0.225)	0.396 (0.270)	0.447 (0.266)	-0.088 (0.428)	-1.077 (0.577)*	-0.256 (0.440)
40-49	-0.261 (0.245)	-0.093 (0.266)	-0.018 (0.248)	0.289 (0.372)	-1.162 (0.486)*	-0.486 (0.398)
50-59	-0.561 (0.248)*	-0.145 (0.254)	0.241 (0.235)	0.061 (0.364)	-0.227 (0.462)	0.087 (0.429)
60 and older	-0.065 (0.261)	0.191 (0.286)	0.403 (0.273)	0.655 (0.377)	-0.332 (0.483)	-0.402 (0.452)
Missing or refused	-0.131 (0.341)	-0.239 (0.406)	-0.070 (0.419)	-0.731 (0.450)	0.061 (0.615)	0.095 (0.722)
Race/Gender (vs. white male)						
White female	0.126 (0.125)	0.110 (0.138)	0.326 (0.136)*	0.043 (0.200)	0.555 (0.240)*	0.353 (0.234)
Black male	-0.519 (0.427)	-0.715 (0.448)	0.137 (0.415)	-0.055 (0.420)	-0.241 (0.626)	-0.411 (0.493)
Black female	-0.089 (0.242)	0.530 (0.225)*	0.396 (0.345)	0.011 (0.426)	0.052 (0.578)	-0.154 (0.472)
Christian	0.146 (0.160)	0.430 (0.194)*	0.435 (0.172)*	0.244 (0.211)	0.011 (0.273)	-0.291 (0.280)
Trust in federal government	0.223 (0.071)**	0.185 (0.070)**	0.027 (0.073)	0.050 (0.107)	-0 160 (0.126)	-0.073 (0.121)
R^2	0.218	0.176	0.269	0.093	0.101	0.140

N=835; Unstandardized regression coefficients (standard error); *p<.05 **p<.01 ***p<.001
Source: IPPSR (2015)

REFERENCES

REFERENCES

Aitken, Andrew. 2019. “Measuring Welfare Beyond GDP.” *National Institute Economic Review* 249(1):R3-R16.

Alderson, Arthur S., and Tally Katz-Gerro. 2016. “Compared to Whom? Inequality, Social Comparison, and Happiness in the United States.” *Social Forces* 95(1):25-53.

Baird, Brendan M., Richard E. Lucas, and M. Brent Donnellan. 2010. “Life Satisfaction Across the Lifespan: Findings from Two Nationally Representative Panel Studies.” *Social Indicators Research* 99:183-203.

Batz, Cassondra, and Louis Tay. 2018. “Gender Differences in Subjective Well-Being.” In *Handbook of Well-Being,* edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Blanchflower, David G. 2021. “Is Happiness U-Shaped Everywhere? Age and Subjective Well-Being in 145 Countries.” *Journal of Population Studies* 43:575-624.

Blanchflower, David G., and Andrew J. Oswald. 2004. “Well-Being Over Time in Britain and the USA.” *Journal of Public Economics* 88(7-8):1359-1386.

Bradburn, Norman M. 1969. *The Structure of Psychological Well-Being*. Chicago, IL: Aldine.

Brulé, Gaël, and Christian Suter. 2019. *Wealth(s) and Subjective Well-Being*. Social Indicators Research Series 76. Cham, Switzerland: Springer Nature.

Cantril, Hadley. 1965. *Pattern of Human Concerns*. New Brunswick, NJ: Rutgers University Press.

Cheng, Sheung-Tak. 2004. “Age and Subjective Well-Being Revisited: A Discrepancy Perspective.” *Psychology and Aging* 19(3):409-415.

Clark, Andrew, Andreas Knabe, and Steffen Rätzel. 2010. “Boon or Bane?: Others’ Unemployment, Well-Being and Job Insecurity.” *Journal of Labour Economics* 17:52-61.

Cole, Elizabeth R. 2009. “Intersectionality and Research in Psychology.” *American Psychologist* 64(3): 170-180.

Crenshaw, Kimberle. 1991. “Mapping the Margins: Intersectionality, Identity Politics, and Violence Against Women of Color.” *Stanford Law Review* 43: 1241-1299.

Deaton, Angus, and Arthur A. Stone. 2014. “Evaluative and Hedonic Wellbeing Among Those With and Without Children at Home.” *Proceedings of the National Academy of Sciences* 111(4): 1328-1333.

Diego-Rosell, Pablo, Robert Tortora, and James Bird. 2018. “International Determinants of Subjective Well-Being: Living in a Subjectively Material World.” *Journal of Happiness Studies* 19(1):123-143.

Diener, Ed. Carol L. Gohm, Eunkook Suh, and Shigehiro Oishi. 2000. “Similarity of the Relations Between Marital Status and Subjective Well-Being Across Cultures.” *Journal of Cross-Cultural Psychology* 31(4): 419-436.

Diener, Ed., Richard E. Lucas, and Shigehiro Oishi. 2009. “Subjective Well-Being: The Science of Happiness and Life Satisfaction.” Pp. 63-73 in *The Oxford Handbook of Positive Psychology,* Second Edition, edited by S. J Lopez and C. R. Snyder. New York: Oxford University Press.

Diener, Ed, Richard E. Lucas, and Shigehiro Oishi. 2018. “Advances and Open Questions in the Science of Subjective Well-Being.” *Collabra: Psychology* 4(1):15.

Diener, Ed., Shigehiro Oishi, Richard E. Lucas. 2015. “National Accounts of Subjective Well-Being.” *American Psychologist* 70(3):234-242.

Diener, Ed, Louis Tay, and David G. Myers. 2011. “The Religion Paradox: If Religion Makes People Happy, Why are so Many Dropping Out?” *Journal of Personality and Social Psychology* 101(6):1278-1290.

Dietz, Thomas. 2015. “Prolegomenon to a Structural Human Ecology of Human Well-Being.” *Sociology of Development* 1(1):123-148.

Dolan, Paul, Laura Kudrna, and Arthur Stone. 2017. “The Measure Matters: An Investigation of Evaluative and Experience-Based Measures of Well-Being in Time Use Data.” *Social Indicators Research* 134:57-73.

Easterlin, Richard A. 2013. “Happiness, Growth, and Public Policy.” *Economic Inquiry* 51(1):1-15.

Eberl, Andreas, Matthias Collischon, and Tobias Wolbring. 2022. “Subjective Well-Being Scarring Through Unemployment: New Evidence from a Long-Running Panel.” *Social Forces* soac022.

Firebaugh, Glenn, and Laura Tach. 2012. “Income, Age, and Happiness in America.” Pp. 267-287 in *Social Trends in American Life: Findings from the General Social Survey Since 1972,* edited by P. V. Marsden. Princeton, NJ: Princeton University Press.

Frey, Bruno S., and Alois Stuzer. 2002. “What Can Economists Learn from Happiness Research*” Journal of Economic Literature* 40(2): 402-435.

Geerling, Danielle M., and Ed Diener. 2020. “Effect Size Strengths in Subjective Well-Being Research.” *Applied Research in Quality of Life* 15: 16-185.

Gerstorf, Denis, Nilam Ram, Ryne Estabrook, Jürgen Schupp, Gert G. Wagner, and Ulman Lindenberger. 2008. “Life Satisfaction Shows Terminal Decline in Old Age: Longitudinal Evidence from the German Socio-Economic Panel Study (SOEP).” *Developmental Psychology* 44(4): 1148-1159

Graham, Jesse, and Jonathan Haidt. 2010. “Beyond Beliefs: Religions Bind Individuals Into Moral Communities.” *Personality and Social Psychology Review* 14(1):140-150.

Graham, Carol, Kate Laffan, and Sergio Pinto. 2018. “Well-Being in Metrics and Policy.” *Science* 362(6412): 287-288

Grover, Shawn, and John F. Helliwell. 2019. “How’s Life at Home? New Evidence on Marriage and the Set Point for Happiness.” *Journal of Happiness Studies* 20:373-390.

Hamoudi, Amar, and Jennifer Beam Dowd. 2014. “Housing Wealth, Psychological Well-Being, and Cognitive Functioning of Older Adults.” *The Journals of Gerontology: Series B* 69(2):253-262.

Hansen, Thomas. 2012. “Parenthood and Happiness: A Review of Folk Theories Verses Empirical Evidence.” *Social Indicators Research* 108:29-64.

Hasting, Orestes P., and Kassandra K. Roeser. 2020. “Happiness in Hard Times: Does Religion Buffer the Negative Effect of Unemployment on Happiness?” *Social Forces* 99(2):447-473.

Helliwell, John F. 2003. “How’s Life? Combining Individual and National Variables to Explain Subjective Well-Being.” *Economic Modeling* 20(2):331-360.

Hoang, Thi Truong An Hoang, and Andreas Knabe. 2020. “Time Use, Unemployment, and Well-Being: An Empirical Analysis Using British Time-Use Data.” *Journal of Happiness Studies*.

Hudson, John. 2006. “Institutional Trust and Subjective Well-Being Across the EU.” *Kyklos* 59(1):43-62.

Iceland, John, and Sarah Ludwig-Dehm. 2019. “Black-White Differences in Happiness, 1972-2014. S*ocial Science Research* 77:16-29.

Institute for Public Policy and Social Research (IPPSR). 2015. *State of the State Survey 70*. Michigan State University: East Lansing, MI: Michigan State University. Retrieved July 30, 2015 (http://ippsr.msu.edu/survey-research/state-state-survey-soss/soss-data/soss-70-winter-2015).

Institute for Public Policy and Social Research (IPPSR). 2022. “SOSS-State of the State Survey.” Retrieved May 31, 2022 (http://ippsr.msu.edu/survey-research/state-state-survey-soss/about-soss).

Jebb, Andrew T., Louis Tay, Ed Diener, and Shigehiro Oishi. 2018. “Happiness, Income Satiation and Turning Points Around the World.” *Nature Human Behaviour* 2:33-38.

Kahneman, Daniel, and Angus Deaton. 2010. “High Income Improves Evaluation of Life but Not Emotional Well-Being.” *Proceedings of the National Academy of Sciences* 107(38):16489-16493.

Killingsworth, Matthew A. 2021. “Experienced Well-Being Rises with Income, Even Above $75,000 per Year.” *Proceedings of the National Academy of Sciences of the United States of America* 118(4):

Knabe, Andreas, Steffen Rätzel, Ronnie Schöb, and Joachim Weimann. 2010. *The Economic Journal* 547:867-889.

Krueger, Alan B., and Andreas I. Mueller. 2012. “Time Use, Emotional Well-Being, and Unemployment: Evidence from Longitudinal Data.” *American Economic Review* 102(3): 549-599.

Lucas, Richard E. 2007. “Adaptation and the Set-Point Model of Subjective Well-Being: Does Happiness Change After Major Life Events?” *Current Directions in Psychological Science* 16(2): 75-79.

Lucas, Richard E., Andrew E. Clark, Yannis Georgellis, and Ed Diener. 2003. “Reexamining Adaptation and the Set Point Model of Happiness: Reactions to Changes in Marital Status.” *Journal of Personality and Social Psychology* 84(3):527-539

Luhmann, Maike, and Sabrina Intelisano. 2018. “Hedonic Adaptation and the Set Point for Subjective Well-Being.” In the *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Luhmann, Maike, Richard E. Lucas, Michael Eid, and Ed. Diener. 2013. “The Prospective Effect of Life Satisfaction on Life Events.” *Social Psychological and Personality Science*. 4(1):39-45.

Lun, Vivian Miu-Chi, and Michael Harris Bond. 2016. “Achieving Subjective Well-Being Around the World: The Moderating Influence of Gender, Age, and National Goals for Socializing Children.” *Journal of Happiness Studies* 17:587-608.

Myrskylä, Mikko, and Rachel Margolis. 2014. “Happiness: Before and After the Kids.” *Demography* 51: 1843-1866.

Nelson, S. Katherine, Kostadin Kushlev, Tammy English, Elizabeth W. Dunn, and Sonja Lyubomirksy. 2013. “In Defense of Parenthood: Children Are Associated with More Joy Than Misery.” *Psychological Science* 24(1): 3-10.

Newman, David B., and Jess Graham. 2018. “Religion and Well-Being.” In *Handbook of Well-Being*. Salt Lake City, UT: DEF Publishers.

Ng, Weiting, and Ed Diener. 2019. “Affluence and Subjective Well-Being: Does Income Inequality Moderate their Associations?” *Applied Research in Quality of Life* 14:155-170.

Ngamaba, Kayonda Hubert. 2016. “Determinants of Subjective Well-Being in Representative Samples of Nations.” *The European Journal of Public Health* 27(2):377-382.

Organisation for Economic Co-operation and Development (OECD). 2013. *OECD Guidelines on Measuring Subjective Well-Being*. Paris, France: OECD Publishing.

Paragment, Kenneth I. “The Bitter and the Sweet: An Evaluation of the Costs and Benefits of Religiousness.” *Psychological Inquiry* 13(3): 168-181.

Pfeffer, Fabian T., and Nora Waitkus. 2021. “The Wealth Inequality of Nations.” *American Sociological Review* 86(4):567-602.

Pierce, Graham L. 2015. *Methodological Report: Michigan State University State of the State Survey 70 (Winter 2015 Round)*. East Lansing, MI: Institute for Public Policy and Social Research, Michigan State University.

Pinquart, Martin. 2001. “Age Differences in Perceived Positive Affect, Negative Affect, and Affect Balance in Middle and Old Age.” *Journal of Happiness Studies* 2:375-405.

Smith, Timothy B., Michael E. McCullough, and Justin Poll. 2003. “Religiousness and Depression. Evidence for a Main Effect and the Moderating Influence of Stressful Life Events.” *Psychological Bulletin* 129(4):614-636.

Stanca, Luca. 2012. “Suffer the Little Children: Measuring the Effects of Parenthood on Well-Being Worldwide.” *Journal of Economic Behavior & Organization* 81(3):742-750.

StataCorp. 2019. *Stata SE 16.1*. College Station, TX.

Stiglitz, Joseph E., Jean-Paul Fitoussi, and Martine Durand. 2019. *Measuring What Counts: The Global Movement for Well-Being*. New York: The New Press.

Stone, Arthur A., and Christopher Mackie. 2013. *Subjective Well-Being: Measuring Happiness, Suffering, and Other Dimensions of Experience*. National Research Council of the National Academies. Washington, DC: The National Academies Press.

Stone, Arthur A., Joseph E. Schwartz, Joan E. Broderick, and Angus Deaton. 2010. “A Snapshot of the Age Distribution of Psychological Well-Being in the United States.” *Proceedings of the National Academy of Sciences* 107(22):9985-9990.

Thomas, William Issac, and Dorothy Swaine Thomas. 1928. *The Child in America: Behavior Problems and Programs*. New York; Alfred A. Knopf.

U.S. Census Bureau. 2013. *2009-2013 American Community Survey, Demographic and Housing Estimates, Michigan*. Washington, D.C.: U.S. Census Bureau. Retrieved April 5, 2020. (https://data.census.gov/cedsci/all?q=Michigan%202009-2013).

Wadsworth, Tim. 2016. "Marriage and Subjective Well-Being: How and Why Context Matters." *Social Indicators Research* 126: 1025-1048.

Yakovlev, Pavel, and Susane Leguizamon. 2012. "Ignorance is Not Bliss: On the Role of Education in Subjective Well-Being." *The Journal of Socio-Economics* 41(6):806-815.

Yang, Yang. 2008. "Social Inequalities in Happiness in the United States, 1972-2004: An Age-Period-Cohort Analysis." *American Sociological Review* 73(2): 204-226.

Yoo, Hyung Chol, Adam Y. Kim, and Richard M. Lee. 2018. "Race and Subjective Well-Being: Critical Race Perspective and Empirical Review of Key Predictors." In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Chapter 3:

Cross-National Social and Environmental Influences on Life Satisfaction

Social scientists and policymakers over the past century have heavily relied on economic indicators to assess human well-being, most notably gross domestic product (GDP) per capita and median household income. These measures, however, have been subject to substantial criticism due to concerns with the assumption that human well-being is simply a function of income or wealth, that such metrics overlook social inequalities, and that they do not account for degradation of the natural environment, which can limit a society's sustainability and long-term well-being (Dietz 2015; Organisation for Economic Co-operation and Development 2019; Dasgupta 2001). In response to these critiques, some scholars have called for alternative measures of human well-being to compliment or even replace those such as GDP per capita (Stiglitz, Fitoussi, and Durand 2019; Dietz 2015). One popular alternative is subjective well-being (SWB), a broad concept which refers to individuals' assessments of their own lives (Diener, Lucas, and Oishi 2018). SWB includes both general life satisfaction as well as the presence and intensity of recent emotional states, such as happiness or worry. SWB has been proposed as a useful indicator of human well-being because it does not rely on objective economic metrics and it is democratic in nature as it empowers individuals to say for themselves how their lives are going (Diener, Lucas, and Oishi 2009). For these reasons, among others, SWB is now measured by the governments of over 40 counties (Diener, Oishi, and Lucas 2015).

Most of the existing research on SWB is in the fields of economics and psychology. Yet, sociological research on the topic is sparse. This is a missed opportunity as sociological theory could aide in explaining how social structures contribute to inequalities in SWB and vice versa. Furthermore, while there is a large literature examining the influence of variables such as income

and employment status on SWB, research on how the condition of the biophysical environment influences SWB is limited. In this study, I addressed these gaps in the literature by examining cross-national social and environmental influences on individual life satisfaction, a widely used and accepted measure of SWB. I drew upon data from the 2019 installment of the Gallup World Poll as well as other sources and employed multi-level regression analysis to account for both individual-level and country-level variables which pertained to individuals' standing in the social structure of their country, the standing of their country within the larger world, as well as individuals' perceptions of the local environment and the relative stress their country is putting on the global environment in terms of the carbon intensity of the national economy.

This study has important implications for sustainable development, which is often described as increasing human well-being while limiting stress on the biophysical environment (Dietz 2015; World Commission on Environment and Development 1987). Over the past 15 years, a literature in environmental and development sociology has emerged which examines how efficiently countries "produce" well-being from their human, economic, and natural capital relative to the stress they are putting on the environment, typically measured by CO_2 emissions per capita (Dietz, Rosa, and York 2009; Dietz and Jorgenson 2014; Jorgenson 2014). This research, sometimes referred to as structural human ecology, ecological intensity of human well-being, or carbon intensity of well-being demonstrates how well-being, measured by life expectancy at birth, is not simply a function of wealth but is influenced by other factors such as education (Kelly 2020) and economic inequality (Kelly, Thombs, and Jorgenson 2021; Jorgenson, Dietz, and Kelly 2018). It also is notable that such studies find that economic growth and corresponding greenhouse gas emissions are not always necessary for increasing well-being and that if countries are efficient in leveraging their other social and human resources, they can

produce relatively high levels of well-being along with lower levels of stress on the environment (Dietz and Jorgenson 2015; Lamb et al. 2014). These studies, however, are almost exclusively at the country-level and have generally not engaged with SWB despite recommendations to do so (Dietz 2015; Roberts et al. 2020). By incorporating both individual-level variables and employing life satisfaction as a measure of human well-being, this study builds upon human structural ecology research by examining how life satisfaction is produced from both individual and country-level resources and how social structures may provide opportunities or constraints to effectively use such resources. Finally, this study assesses the utility of life satisfaction as a measure of sustainable development. If life satisfaction is in part a function of the condition of the biophysical environment, that would provide more evidence that life satisfaction and perhaps other measures of SWB are worthy replacements of economic metrics like GDP per capita, which are not responsive to environmental conditions and therefore, are of very limited use in sustainability assessment.

Background

Measuring SWB Cross-Nationally

SWB is typically measured by standardized questions incorporated into surveys. These questions measure either general life satisfaction or the presence and intensity of recent emotional states. Since SWB questions are included in several reputable cross-national surveys and due to interest in cross-national comparisons of SWB, a crucial consideration is how well these measures perform cross-nationally. This issue has been extensively examined in the literature to ensure that comparative work can proceed on solid methodological grounds. The general conclusion is that cultural considerations, such as varying definitions of a good life and

norms regarding emotions, in part account for cross-national differences in mean life satisfaction and other measures of SWB (Diener et al. 2018a; Fulmer et al. 2010; Ford et al. 2015). However, more sophisticated analyses where the antecedents and consequences of SWB variables are examined via statistical modeling with regression, structural equation modeling, multi-level modelling and other methods have been found to be reasonably robust (OECD 2013; Helliwell 2008; Suh and Koo 2008). Furthermore, as the Organisation for Economic Co-operation and Development (OECD) (2013) emphasizes, one the best methods for assessing the feasibility of measuring SWB variables cross-nationally is through repeated surveys which employ sound and transparent survey design principles. To address this call, multiple organizations have published guides on best practices for measuring SWB cross-nationally, including the OECD (2013), the National Research Council (Stone and Mackie 2013), and the United Nations Development Programme (Anand 2016). Most large cross-national surveys that measure SWB, such as the Gallup World Poll, which I relied upon in this study, have adopted such recommendations.

Social Influences on Life Satisfaction

Numerous large-scale cross-national and national surveys have been employed to examine social influences on life satisfaction and self-rated happiness.[4] A few notable findings emerge. First, there is a consistent positive association between income and individual life satisfaction, with those with higher incomes generally reporting higher life satisfaction even when controlling for other demographic variables (Diener et al. 2018a). Studies on wealth (e.g.

[4] The terms life satisfaction and happiness are often used interchangeably. Some large-scale surveys examine life satisfaction, some ask about happiness, and many ask about both. At times, measures of life satisfaction and happiness are combined into a single scale. While the concepts have much overlap, research suggests that these terms should not be conflated with one another. (Kahneman and Deaton 2010; Røysamb, Nes, and Vittersø 2014; Gundelach and Kreiner 2004). This is in part because life satisfaction is a cognitive evaluative assessment of one's quality of life, while happiness implies an affective component. However, this chapter generally uses the term life satisfaction even when discussing a few studies which measured overall happiness for ease of interpretation.

home values, securities) are very limited but results suggest that it could be even more robust in predicting life satisfaction than income (Brulé and Suter 2019; Headey and Wooden 2004). This is because wealth tends to be less volatile and is a better indicator of social class than income (Burlé and Suter 2019). However, national context matters, as research which accounts for both individual and country-level variables finds that the effect of individual or household income is greatly reduced or eliminated altogether when accounting for national wealth measured by GDP per capita, suggesting that the capacity for countries to provide vital services for people may at least in part offset the need for higher incomes (Bonini 2008; Diener, Tay, and Oishi 2013).

Another consistent finding is that unemployed individuals demonstrate lower life satisfaction compared to the employed. This finding persists when controlling for lower incomes which result from the loss of employment, suggesting that being active, feeling a sense of purpose, and cultural norms about needing to contribute to society and provide for one's family factor into this decreased life satisfaction (Clark, Knabe, and Rätzel 2010; Lucas et al. 2004; Hoang and Knabe 2021). Some studies suggest that higher local or national unemployment rates also contribute to lower SWB, even among those who are employed or retired (Luhmann, Murdoch, and Hawkley 2015; Clark et al. 2010).

Studies on the relationship between age and life satisfaction generally identify a "U-shaped" curve where life satisfaction and happiness are highest during young and late adulthood, with lower levels in the 40s and 50s (Diener et al. 2018b). Research by Blanchflower (2021) and Beja (2018) found this curve is generally consistent cross-nationally. Findings on gender differences in life satisfaction are mixed in terms of whether men or women demonstrate higher life satisfaction and when significant findings are found, their effects are small (Batz and Tay 2018).

Studies tend to find that married individuals report higher life satisfaction than those who are not married or are separated or widowed (Diener et al. 2018b). Several individual-level studies have identified a positive relationship between educational attainment and life satisfaction when controlling for variables such as income and employment status (Kahneman and Deaton 2010; Blanchflower and Oswald 2004). Studies at higher levels of analysis, such as the county, state, and cross-national-level, have also identified an influence of mean educational attainment on mean life satisfaction with more robust effect sizes (Helliwell 2003; Yakovlev and Leguizamon 2012; Lawless and Lucas 2011). To little surprise, research on health and life satisfaction demonstrates that those in good physical and mental health report higher life satisfaction than those experiencing significant health challenges (Boehm 2018; Cross et al. 2018).

Countries demonstrating the highest mean life satisfaction among their populations are typically characterized as having a high degree of economic development with relatively low-income inequality, significant political freedoms, and a generous social safety net (e.g. unemployment insurance, social security, paid parental leave), where individuals demonstrate a high degree of trust in national institutions as well as each other (Diener et al. 2015; Diener and Biswas-Diener 2002; Veenhoven 2009; Sjöberg 2010). Many of these qualities are present in nations such as Switzerland and Scandinavian nations, which routinely demonstrate the highest levels of life satisfaction among their populations (Helliwell et al. 2020; Bonini 2008).

It should be noted that the nature of the relationship between national wealth (measured as GDP per capita) and life satisfaction as well as income inequality (typically measured by a Gini coefficient) and life satisfaction are contested. Cross-sectional as well as longitudinal studies have found a positive association between GDP per capita and life satisfaction when

controlling for other country-level variables (Diener and Tay 2015; Stevenson and Wolfers 2008; Helliwell 2003). Research by Easterlin (1974; 2013) and others, however, found that when examining data spanning several decades, increases in national wealth did not correspond with increases in life satisfaction regardless of whether a country was highly economically developed or not, an observation colloquially known as the "Easterlin Paradox". Some studies suggest that this paradox is in part due to a mediating effect of income inequality on the relationship between life satisfaction and income. For example, Oishi and Kesbir (2015) analyzed data from 34 countries and found that an increase in GDP per capita was associated with increased mean life satisfaction only when it was not accompanied by an increase in income inequality during that same period. This raises the question of whether the effect of income on life satisfaction results from relative or absolute income, a point which has been extensively debated and researched (Easterlin 1974; Luttmer 2005; Ferrer-i-Carbonell 2005).

Understanding the Easterlin Paradox becomes more complex when considering that the results of studies on the relationship between income inequality and life satisfaction are mixed, with some studies finding a negative association (Diener and Tay 2015; Graafland and Lous 2018), some finding no significant association (Helliwell 2003; Veenhoven 1996), and others identifying a positive relationship (Katic and Ingram 2017; Rözer and Kraaykamp 2013; Ng and Diener 2019). Verme (2011) suggests these varying results may be in part a function of how measures of inequality are calculated, the degree of multicollinearity between independent variables, as well considerations of the data structure (i.e. country or individual-level). In a study in Europe and the United States, Alesina, Di Tella, and MacCulloch (2004) found substantial differences in the relationship between income inequality and life satisfaction based upon culture, political views, and social class. Overall, how individual or country mean life

satisfaction is influenced by national wealth and inequality remain interesting areas of inquiry and it is crucial to incorporate these variables into models predicting cross-national life satisfaction.

Environmental Influences on Life Satisfaction

One of the shortcomings of the research on cross-national influences on life satisfaction is that most studies do not consider variables pertaining to the condition of the biophysical environment. This is problematic because linkages between environmental conditions and life satisfaction have important implications for sustainable development, which emphasizes improving human well-being in a manner that limits stress on the environment (Dietz 2015). If life satisfaction is a function of more than just social or economic considerations but also the condition of the biophysical environment, this would suggest that life satisfaction and other SWB measures may hold promise as sustainable development indicators.

The relatively small but growing subset of studies that do explore such topics suggest that local as well as global environmental conditions indeed factor into individual life satisfaction. Among the first to examine this relationship was Welsch (2002). Through examining cross-sectional data from 54 countries, they identified a negative relationship between country mean happiness and nitrogen dioxide air pollution when controlling for other country-level variables such as gross national product per capita. More recent research has similarly found negative effects of objective and subjective measures of local air pollution on life satisfaction and other measures of SWB (Dolan and Laffan 2016; Diener and Tay 2015; Liao, Shaw, and Lin 2014; Luechinger 2009). Studies have also identified positive effects of access to and time spent in

green space (e.g. parks, nature areas, gardens) on life satisfaction (MacKerron and Mourato 2013; Ambrey and Fleming 2014; Bertram and Rehdanz 2015).

Engelbrecht (2009) and Vemuri and Costanza (2006) found a positive association between mean national life satisfaction and natural capital when controlling for other factors such as GDP. Bonini (2008), using data from the World Values Survey, found that life satisfaction was positively associated with the Environmental Sustainability Index (now known as the Environmental Performance Index; see Environmental Performance Index 2021), a metric designed to evaluate a country's environmental health and ecosystem vitality, when controlling for the region of the world the country was in and several individual-level variables. Yet this relationship was relatively weak and explained a very small portion of variance in life satisfaction compared to other country-level variables, such as GDP per capita. However, they note: "it is possible that environmental sustainability has important long-term effects that are not captured in this study since unsustainable activities [e.g. certain forms of economic development] can have positive effects [on life satisfaction] in the short-term but negative effects in the long-term" (Bonini 2008:231).

A crucial question for sustainable development is whether sacrifices in human well-being are necessary to limit stress on the environment. Or asked another way, are the environmental harms associated with economic development necessary for increasing human well-being? Research on the ecological intensity of human well-being provides some insight. Studies have found that, especially in the last few decades, increases in national GDP per capita have coincided with less environmentally efficient production of human well-being both in terms of environmental footprint as well as CO_2 emissions per capita (Jorgenson and Dietz 2015; Jorgenson 2014; Jorgenson and Givens 2015). Examining over 100 years of data for the United

States, Kelly et al. (2021) found a negative association between CO_2 emissions per capita and life expectancy when controlling for GDP per capita. In a study of developing nations, Omri et al. (2022) found a negative association between life satisfaction and CO_2 emissions per capita as well as the carbon intensity of national economies, which refers to the ratio of CO_2 emissions to GDP. These studies suggest that much of the gains in well-being resulting from economic development have been counteracted by the negative effects of greenhouse gas emissions.

The findings from the ecological intensity of well-being literature are noteworthy for a few reasons. First, they suggest that current patterns of economic growth are likely to exacerbate environmental problems with little relative gains in human well-being, especially in affluent nations. This is a major threat to sustainable development. Second, and relatedly, they suggest that it is important to consider alternative strategies for increasing human well-being. Finally, they emphasize the need to decouple economic development and environmental degradation to sustainably promote human well-being, a goal in line with theories of ecological modernization (Mol 2003; Kelly 2020).

In this study, I built upon the literatures just discussed in three key ways. First, I incorporated both social and environmental variables to examine cross-national influences on individual life satisfaction. Second, to do so, I employed multi-level regression analysis to account for the fact that individuals were nested within countries. Most cross-national studies on life satisfaction have not used this technique even when incorporating both individual and country-level variables. This is problematic because two individuals from the same country are likely to be more similar to one another than two individuals living in different countries, meaning the study samples are clustered, a violation of the assumptions of most ordinary least squares and logistic regression techniques. Multi-level regression, on the other hand, accounts

for this hierarchical structure to estimate the standard errors of regression coefficients more accurately and produce estimates of both fixed and random effects (Hox, Moerbeek, and van de Schoot 2017). Finally, I built upon the ecological intensity of well-being literature by examining how both countries and individuals drew upon their economic, human, and social resources to "produce" life satisfaction while also accounting for environmental conditions at both the local and country-level. In doing so, I assessed the utility of life satisfaction as a potential sustainable development indicator.

Data and Methods

Individual-Level Data

The individual-level data were from the 2019 installment of the Gallup World Poll, a large cross-national survey administered since 2005 in over 160 countries and independently governed territories. Since its onset, the Gallup World Poll has interviewed millions of individuals ages 15 and older regarding their opinions on local, regional, and global issues, their standard of living, household characteristics, and their standing in the general social structure of their country and community. The survey is administered throughout the year and the method of data collection varies depending on local infrastructure and the capabilities of partnering organizations which conduct the interviews. In general, the surveys are conducted through telephone interviews, but sometimes in-person interviews take place when it is difficult to reach individuals by telephone, such as in rural areas of developing nations. The data are weighted to account for household size to adjust for the probability of selection, as residents in larger households are less likely to be selected into the sample. Weights are also constructed to ensure

the data are as nationally representative as possible, adjusting for gender, age, education, and socioeconomic status based on the availability of such data within each country (Gallup 2018).

The 2019 data consist of responses from 117,072 individuals across 102 countries and territories. I only included data for individuals 18 years or older in this study[5] and used listwise deletion to remove cases with missing values for the individual and country-level variables. Excluding respondents under 18 resulted in dropping 5,390 respondents from the data. Most other excluded cases were a result of missing country-level data, in which all respondents from those countries or territories were removed. This included Taiwan (N=1,030), Kosovo (N=1,088), Hong Kong (N=1,004), Palestine (N=1,090), and Uzbekistan (N=1,080). The final dataset for this study consisted of 97,325 individuals living in 97 countries.

The dependent variable, individual life satisfaction, was measured by Cantril's ladder (Cantril 1965), a metric which has been used extensively in cross-national research. Respondents were prompted to "Imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you". They were then asked, "On which step of the ladder would you say you personally feel you stand at this time?".

The individual-level independent variables included three subjective measures of satisfaction with the condition of the biophysical environment and efforts to protect it. Respondents were asked whether they were satisfied with their local air quality, local water quality, and the efforts being made in their country to preserve the environment. They were able to reply "yes", indicating satisfaction, or "no", indicating dissatisfaction for each of these questions. The other individual-level variables included respondents' annual household income,

[5] Using data from individuals under 18 would have required specific Institutional Review Board approval that I did not seek and therefore, I limited my analysis to individuals at least 18 years of age or older.

age, gender, highest level of education, employment status, marital status, and self-rated health. Annual household incomes were converted to 2016 U.S. dollars so that comparisons could be made cross-nationally. This included adjusting for purchasing power parity, which accounts for the varying costs of goods across countries (Gallup 2018; International Comparison Program 2015). To assess health status, respondents were asked whether they had a health problem which prevented them from "doing any of the things people [their] age normally can do" (Gallup 2018:41).

Country-Level Data

I incorporated five country-level variables from several sources. These included two environmental variables: the carbon intensity of countries' economies and the percent of protected land among countries' total land area, both as of 2018. Carbon intensity refers to the ratio of a country's production-based CO_2 emissions to its total GDP. The data were from Bolt and van Zanden (2020) and were measured in kilograms of CO_2 per one dollar of GDP (in 2011 U.S. dollars, adjusted for purchasing power parity). The data only accounted for emissions within each country's territory and not for emissions corresponding to traded goods. Carbon intensity was included as a proxy measure of how efficient a nation is in economic development relative to the stress it places on the biophysical environment. The percent protected lands data were from the World Database on Protected Areas (2018) and were included to reflect conservation efforts within countries as well as the proportion of land which is green space. Protected areas were defined as at least 1,000 hectares designated by national governments as "national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, or areas managed mainly for sustainable use." It is important to note that this data did not

indicate how well these areas were being managed and that some protected areas at the state or local level may have not been included.

The other country-level variables included GDP per capita as of 2019, the mean years of formal education completed among a country's population, and wealth inequality. The GDP data were obtained from the World Bank's (2019) data repository. Like annual household income, data were reported in U.S. dollars adjusted for purchasing power parity. GDP per capita was included as a measure of national wealth and economic development. The mean years of education data, which served as a measure of human capital, were from 2017 and obtained from Roser and Ortiz-Ospina's (2017) global education database. Wealth inequality was measured by a wealth Gini coefficient calculated by Credit Suisse's Research Institute (2019), a global investment firm, and published in their 2019 Global Wealth Databook. As with income Gini coefficients, values ranged from 0 to 100, with 0 indicating perfect equality and 100 indicating perfect inequality.

I chose to include wealth inequality in this study rather than income inequality due to recent research suggesting that wealth, while studied far less frequently than income, is in fact a stronger influence on life satisfaction and "provides much more information about people's economic conditions than previous income" (Brulé and Suter 2019:3). Wealth is typically distributed much more unequally than income and furthermore, levels of wealth inequality often do not mirror levels of income inequality within nations (Pfeffer and Waitkus 2021). For example, Sweden and Denmark, two countries hailed as being egalitarian due to low income inequality, demonstrate relatively high wealth inequality. Meanwhile, Southern European countries demonstrate the opposite trend (Brulé and Suter 2019). Thus, it appears appropriate to include both income and wealth inequality in the same model when estimating life satisfaction.

However, through some preliminary analysis for this study, I found that income inequality (measured by a Gini coefficient) was not a significant predictor of life satisfaction when controlling for the other independent variables and its inclusion in the model did not improve the model fit, so it was therefore omitted from the final analysis. I also included national unemployment rate in my preliminary analysis but did not keep this variable in the final models for the same reasons just mentioned. The wealth Gini, on the other hand, did result in an improvement in model fit and was included in the analysis presented here.

Finally, I initially intended to use CO_2 emissions per capita from the World Bank (2016) as a measure of stress countries are putting on the biophysical environment, but it was very highly correlated with GDP per capita ($r = .737$), suggesting that they were both essentially measures of national wealth and economic development. Other studies have found high collinearity between CO_2 and GDP to be problematic, as well (e.g. Bonini 2008). Carbon intensity, on the other hand, was only moderately correlated with GDP per capita ($r = .404$) and therefore, was not simply a reflection of economic activity but instead a measure of economic efficiency and could reasonably be included in the same model without significant collinearity concerns.

Sample Characteristics

Tables 3.1 and 3.2 display the sample descriptive statistics. Table 3.1 contains the frequencies and percentages for the categorical variables. Most respondents reported satisfaction with their local air and water quality, but about 25 percent and 30 percent, respectively, were dissatisfied. A slight majority (56.1 percent) of respondents reported satisfaction with the efforts to preserve the environment in their country. The sample was 53.3 percent female and most

reported (58.8 percent) being married or in a domestic partnership, while about a quarter of respondents were single and never married. About 27 percent reported a health condition which limited them from participating in activities they felt most people their age could engage in. A slight majority of respondents had a secondary (but not tertiary) education (51.6 percent), as in 9 to 15 years of formal schooling. Around 18 percent reported a tertiary education (4 years beyond a secondary education). The most common employment status was full-time (40.9 percent), which Gallup defined as at least 30 hours per week, followed by out of the labor force (35.5 percent), which included retirees, homemakers, and individuals supported by a disability program, among others. Around 7 percent of respondents reported being unemployed and looking for work, while 16.7 percent were employed part-time (less than 30 hours per week).

Table 3.1 also displays which of the World Bank regions (2018) individuals live in. The largest percentage of respondents were living in the Europe and Central Asia region (31.2 percent), followed by Sub-Saharan Africa (27.5), Asia and the Pacific (16.1), Latin America and the Caribbean (10.1), the Middle East and North Africa (7.7), South Asia (5.3), and North America (2.1), which only includes the United States and Canada. The number of respondents and mean life satisfaction scores for each nation, organized by World Bank region, are displayed in the appendix. The mean life satisfaction score across the entire sample was 5.66. The region with the highest mean life satisfaction was North America (7.26 out of 10), while the lowest was Sub-Saharan Africa (4.49). The nations with the highest mean life satisfaction were Denmark (7.77), Switzerland (7.70), and the Netherlands (7.55), followed by Norway and Sweden (Both 7.50). The countries with the lowest mean life satisfaction, which were largely in Sub-Saharan Africa, included Zimbabwe (2.68), Rwanda (3.27), and Zambia (3.43). The nations with the

lowest mean life satisfaction outside of Sub-Saharan Africa were Jordan (4.30) and Myanmar (4.48).

Table 3.2 displays the means, medians, and standard deviations for both the individual-level and country-level continuous variables. The mean age was 42.72 years. The mean annual household income was $26,527.53, but the median was $9,840.84, demonstrating a highly positively skewed distribution (as is also indicated by the very large standard deviation of $149,926.46). The mean carbon intensity was 0.22 kg of CO_2 per dollar of GDP, while the mean percent protected lands was 17.31 percent. The mean GDP per capita was $24,191.84, while the median was $14,496.13, again demonstrating a positively skewed distribution. The mean years of education was 8.56 years, while the mean wealth Gini coefficient was 73.16.

Table 3.1: Descriptive Statistics for Categorical Variables

	Frequency	*Percentage*		*Frequency*	*Percentage*
Satisfied with air quality			Level of Education		
Yes	72,614	74.6	Elementary or less (0-8 years)	29,293	30.1
No	24,711	25.4	Secondary (9-15 years)	50,195	51.6
Satisfied with water quality			Tertiary (4 years beyond secondary)	17,837	18.3
Yes	68,565	70.4			
No	28,760	29.6	Employment status		
Satisfied with efforts to preserve the environment			Full-time	39,833	40.9
Yes	54,562	56.1	Part-time	16,290	16.7
No	42,763	43.9	Unemployed	6,621	6.8
Gender			Out of the labor force	34,581	35.5
Female	51,900	53.3	Region		
Male	45,425	46.7	East Asia/Pacific	15,687	16.1
Marital status			Europe and Central Asia	30,377	31.2
Single, never married	25,817	26.5	Latin America /Caribbean	9,814	10.1
Married or domestic partner	57,429	58.8	Middle East/North Africa	7,519	7.7
Divorced, widowed, or separated	14,322	14.7	North America	2,002	2.1
			South Asia	5,192	5.3
Health problem			Sub-Saharan Africa	26,734	27.5
Yes	26,696	26.9			
No	72,555	73.1			

N=97,325; Source: Gallup (2019)

Table 3.2: Descriptive Statistics for Continuous Variables

	Mean	*Median*	*Std. Dev.*
Individual Characteristics			
Age	42.72	40	17.35
Annual household income (2016 U.S. dollars)	26,527.53	9,840.84	149,926.46
Country Characteristics			
Carbon intensity (kg of CO_2 per dollar of GDP)	0.22	0.19	0.15
Protected lands (%)	17.31	17.50	10.83
GDP per capita	24,191.84	14,496.13	24,598.03
Mean years of education	8.56	8.80	3.25
Wealth Gini coefficient	73.16	72.60	7.07

N=97,325; Source: Gallup (2019), Bolt and van Zanden (2020), World Bank (2019), World Database on Protected Areas (2018), Roser and Ortiz-Ospina (2017), Credit Suisse Research Institute (2019)

Analysis

I used multi-level regression with restricted maximum likelihood (REML) estimation to regress life satisfaction on the independent variables. My analysis was conducted using the MIXED procedure in IBM's SPSS Statistics 28 (2021). Some of the continuous variables had numerous influential outliers, specifically respondents' annual household income[6] as well as countries' carbon intensity and GDP per capita. To address this problem, I employed log-transformation using the natural log. This also accounted for potential diminishing returns in life satisfaction from household income, national wealth, and CO_2 emissions suggested by some studies (Diener et al. 2018b; Diener and Seligman 2004; Vita et al. 2019). After these transformations, I grand mean centered all continuous variables, as is standard practice in multi-level regression. This allows for simple interpretation of the intercept (now the average expected life satisfaction score when all continuous independent variables are set at their means and

[6] Since some respondents had annual household incomes of $0 and the natural log of 0 is undefined, I added $1 to each value prior to transformation.

categorical independent variables are set at zero) as well as the random effects (now the expected variances for a subject who has the mean score for all continuous variables and a value of zero for all categorical variables) (Hox et al. 2017).

My analysis consisted of running two models. The first model was a null or intercept-only model which served the purpose of identifying whether there was significant variation in individual life satisfaction across the countries and therefore, whether multi-level regression was appropriate. The second model incorporated all the independent variables. Regression diagnostics demonstrated high collinearity among two of the country-level variables, GDP per capita (logged) and mean years of education (r = .880). Their variance inflation factors, however, were around 5, suggesting they could be included in the same model but should be interpreted with some caution. There were no other apparent violations of the model assumptions. A correlation matrix including Pearson's correlation coefficients between all dependent and independent variables is displayed in Table 3.6 of the appendix of this chapter.

Results and Discussion

The null model estimated an interclass correlation coefficient (ICC) of 19.1 (Wald Z = 6.861; p<.001), implying 19.1% of the variance in individual life satisfaction could be explained by country. This was evidence of significant nonindependence in the data and hence the need for multi-level modelling to account for the hierarchical structure. This number is also remarkably close to Bonini's (2008) estimate of 19% using data from the World Values Survey.

Table 3.3 displays the fixed effects from the second model which regressed life satisfaction on the social and environmental variables. The model had a marginal pseudo r-

square of .181 and a conditional pseudo r-square of .269.[7] Individuals who reported being satisfied with their local air quality demonstrated higher life satisfaction than those who were dissatisfied, controlling for the other variables. Satisfaction with local water quality as well as respondents' satisfaction with the efforts towards preserving the environment in their country also demonstrated positive effects on life satisfaction. This is noteworthy as it suggests that the relationship between satisfaction with environmental conditions and life satisfaction cannot be explained simply by economic factors such as household income and national wealth, which can provide privileged access to less polluted environments as well as countries the resources to mitigate pollution or export it to less affluent countries (Givens, Huang, and Jorgenson 2019).

Several individual-level social variables exerted significant effects on life satisfaction. First, those with higher household incomes (logged) reported higher life satisfaction on average, controlling for the other variables. In line with some other cross-national studies (Blanchflower and Oswald 2004; Batz and Tay 2018), women demonstrated higher life satisfaction than men. Age was not a significant predictor of life satisfaction, regardless of whether this relationship was modelled as linear or u-shaped. Individuals who had at least four years beyond a secondary education reported significantly higher life satisfaction compared to respondents who had no more than a secondary or primary education. In agreement with much of the literature, unemployed respondents reported significantly lower life satisfaction than those who were employed full-time. Those employed part-time (less than 30 hours per week), on the other hand, reported higher life satisfaction than respondents employed full-time, even when controlling for variables such as household income. A possible explanation for this based upon previous studies is that these individuals may benefit from having more control over how they spend their time

[7]A marginal pseudo r-square refers to the variance in the dependent variable explained by the fixed effects, while the conditional pseudo r-square refers to the variance explained by both the fixed and random effects (Love 2020).

than those working full-time (Hoang and Knabe 2021; Martella and Maass 2006) while still receiving the benefits of employment such as income and staying active. Other explanations include that these individuals do not feel as economically stressed and pressured to work more, as well as they do not place an especially high emphasis on material wealth, which has been found to be associated with lower life satisfaction (Kasser 2018).

Table 3.3: Fixed Effects of Social and Environmental Variables on Life Satisfaction

	b	*SE*	*t(df)*
Intercept	5.152***	.071	72.67 (103.62)
Air quality satisfaction	.109***	.027	4.11 (102.62)
Water quality satisfaction	.287***	.023	12.42 (94.73)
Environmental preservation satisfaction	.287***	.026	11.06 (94.86)
Annual household income (logged)	.188***	.013	14.49 (80.32)
Gender (Male=0, Female=1)	.243***	.031	7.76 (96.63)
Age	-.001	.001	-0.86 (102.46)
Higher education (vs. high school or less)	.463***	.029	16.14 (64.32)
Employed part-time (vs. full-time)	.113***	.029	3.87 (107.29)
Unemployed	-.379***	.043	-8.75 (96.74)
Not in the labor force	.045	.025	1.76 (103.89)
Married/domestic partner (vs. single)	-.036	.029	-1.24 (121.84)
Divorced/widowed/separated	-.295***	.038	-7.82 (112.92)
Health problem	-.517***	.036	-14.50 (98.22)
Carbon intensity of economy (logged)	-.173	.132	-1.31 (89.74)
Protected lands (%)	.008	.006	1.19 (88.88)
GDP per capita (logged)	.450***	.118	3.83 (89.75)
Mean years of education	.040	.044	0.91 (88.99)
Wealth Gini	.025*	.010	2.43 (88.14)

NOTE *b* = unstandardized regression coefficients, *p <.05, **<.01, ***<.001, N=97,325
Source: Gallup (2019), Bolt and van Zanden (2020), World Bank (2019), World Database on Protected Areas (2018), Roser and Ortiz-Ospina (2017), Credit Suisse Research Institute (2019)

Those who were not in the labor force did not report significantly different life satisfaction scores from those employed full-time. Married respondents or respondents with a domestic partner did not demonstrate differences in mean life satisfaction from those single and

never married. Respondents who were divorced, widowed, or separated reported lower life satisfaction than individuals who were single or married. Finally, respondents who reported having a health problem which prevented them from doing things they felt peers their age could normally do demonstrated lower life satisfaction than those who did not report a health problem.

Regarding the effects of the country-level variables on individual life satisfaction, respondents living in nations with higher GDP per capita (logged) demonstrated higher life satisfaction when controlling for the other variables, including annual household income (logged). Mean years of education was not a significant predictor of life satisfaction. However, as suggested by Helliwell (2003), it is possible many of the documented benefits of national education have an indirect, rather than direct, influence on life satisfaction through the creation and maintenance of human capital which supports the economy, governance, and cultural institutions. This hypothesis is partly supported by the high bivariate correlation between GDP per capita (logged) and means years of education.

Neither the percent of protected lands nor carbon intensity of the economy (logged) were significant predictors of life satisfaction when controlling for the other variables. The latter finding suggests that higher CO_2 emissions relative to GDP provides no benefit to individual life satisfaction, evidence of a decoupling of economic development and greenhouse gas emissions. It also emphasizes the need to explore alternative pathways to promoting life satisfaction. For example, the findings from this study demonstrate that satisfaction with local environmental conditions and efforts to preserve the environment contribute to higher life satisfaction, suggesting that conservation and environmental remediation activities present opportunities to sustainably increase it.

Higher national wealth inequality was associated with higher life satisfaction. This is a notable finding as inequality is often described as being divisive and contributing to numerous social problems (Wilkinson and Pickett 2009). The findings from this study, however, agree with others that found a positive association between these variables (Katic and Ingram 2018; Rözer and Kraaykamp 2013; Ng and Diener 2019). Scholars have proposed a few possible explanations for this observation. First, some cultures, such as that of the United States, are more tolerant of inequality as it reaffirms individualism and social mobility (Clark 2003; Berg and Veenhoven 2010). In this case, people who are relatively less wealthy may see inequality as evidence that they could potentially accumulate more wealth and use this as an incentive to work toward their economic goals (Alesina et al. 2004; Verme 2011). This explanation has also been suggested for developing countries where inequality could be perceived as evidence of economic development which has enabled a subset of individuals to become affluent. Seeing this, the general population may come to believe that living standards across the whole population will eventually increase as the benefits of development spread, a prospect which can promote optimism and thus, higher life satisfaction (Ngamaba, Panagioti, and Armitage 2018). It is possible such beliefs were prominent among the respondents in this study, explaining the positive effect of inequality on life satisfaction. Thus, the perceived positive benefits of the causes of inequality may outweigh their negative consequences (Berg and Veenhoeven 2010). In conclusion, more research is needed to understand the complex relationship between inequality and life satisfaction. This should include examining both the role of wealth inequality, as this study was among the first to do, as well as income inequality. Studies will also need to examine what national and individual characteristics mediate this relationship.

Finally, the random effects (Table 3.4) were all significant, demonstrating that the fixed effects of the individual-level variables on life satisfaction varied significantly across the countries. These random effects estimates can be used to calculate confidence intervals around the fixed effects to better understand the degree of variation. Such confidence intervals appear to be very tight, likely a reflection of the large sample size. For example, the confidence interval for the effect of satisfaction with environmental preservation at the p<.001 level was .239 to .243. This suggests that while some cross-country variation exists for these effects, the fixed effects can be accepted as generally consistent estimates across the whole sample.

Table 3.4: Random Effects of Social and Environmental Variables on Life Satisfaction

	σ^2	*SE*	*Wald Z*
Intercept	.399***	.067	5.99
Air quality satisfaction	.031***	.009	3.44
Water quality satisfaction	.016*	.007	2.42
Environmental preservation satisfaction	.037***	.009	3.95
Annual household income (logged)	.013***	.002	5.13
Gender (Male=0, Female=1)	.069***	.013	5.08
Age	.001***	.000	5.13
Higher education (vs. high school or less)	.026*	.011	2.29
Employed part-time (vs. full-time)	.029**	.010	2.79
Unemployed	.068**	.023	2.91
Not in the labor force	.024**	.008	2.82
Married/domestic partner (vs. single)	.040***	.010	3.93
Divorced/widowed/separated	.050**	.017	2.84
Health problem	.086***	.017	4.98

NOTE *p <.05, **<.01, ***<.001, N=97,325
Source: Gallup (2019)

Conclusion

Scholars and policymakers are increasingly recognizing life satisfaction and other measures of SWB as useful development indicators. This has corresponded with a large body of research on SWB, mostly in the fields of economics and psychology. However, research on

SWB in sociology is very limited. There is also only a small subset of this research that considers the effects of the condition of the biophysical environment on SWB. In this study, I addressed these gaps in the literature by examining social and environmental influences on life satisfaction. To do so, I employed multi-level regression analysis using data from over 97,000 individuals living across 97 countries. Many of the study findings were in support of other large-scale studies which highlight the influence of social factors, such as household income, gender, employment status, educational attainment, marital status, and health on individual life satisfaction. This study also found positive effects of respondents' satisfaction with their local air quality, water quality, as well as the efforts being made to preserve the environment in their country, when controlling for the social variables. All the significant individual-level social and environmental influences on life satisfaction demonstrated statistically significant, although very small, cross-country variance in their effects.

Some country-level variables also emerged as significant influences on individual life satisfaction. GDP per capita (logged) exerted a positive effect on life satisfaction even when controlling for annual household income (logged). The carbon intensity of countries' economies was not a significant predictor of individual life satisfaction when controlling for the other variables, suggesting that emitting more CO_2 relative to GDP does not provide benefits in life satisfaction and perhaps human well-being in general. This is a notable finding as it contradicts the assumption that reducing greenhouse gas emissions requires sacrifices in human well-being (Kelly et al. 2021). Instead, this observation encourages alternative pathways to sustainably increase well-being and suggests that, in many instances, countries could reduce the carbon intensity of their economies while still increasing life satisfaction, such as through environmental protection or education. Failure to seriously pursue sustainable development could result in many

of the gains in human well-being over the last several decades being threatened by rapid environmental degradation related to climate change. Furthermore, the fact that life satisfaction was in part a function of environmental variables when controlling for numerous social variables suggests that life satisfaction and SWB in general could be valuable indicators of sustainable development. For example, if economic development was contributing to increased life satisfaction within a country but also causing environmental degradation, both these positive and negative effects would be reflected in life satisfaction scores. Future studies could build upon human structural ecology and ecological intensity of well-being research to identify how countries can most sustainably produce well-being from their economic, human, and natural resources (Dietz et al. 2009).

In agreement with some other studies (Katic and Ingram 2017; Rözer and Kraaykamp 2013; Ng and Diener 2019), I found a positive effect of national wealth inequality on individual life satisfaction. While I proposed a few possible explanations for this observation, the mixed findings across the literature warrant more detailed research to untangle the true relationship between inequality (both income and wealth) and life satisfaction, as well as the variables which may mediate this relationship. Such research would have important policy implications as global and national inequality are prominently discussed social issues.

It is my hope that this study promotes more interest in SWB among sociologists. Such research could be instrumental in developing and refining sociological theories by exploring how societal factors contribute to social inequalities in SWB, our relationships with the environment, as well as how societies change due to economic and technological development.

The main limitation of this study is that it attempts to identify influences on life satisfaction using only cross-sectional data. Ultimately, longitudinal research is required to

establish causal relationships more confidently. This is especially important for research on life satisfaction and SWB as these variables can also influence life outcomes (Diener et al. 2018). For example, while many studies have found married individuals to be happier than those who are not married, some research also suggests that happier individuals are more likely to marry and stay married (Lucas et al. 2003; Luhmann et al. 2013). This problem of reverse causality can only be properly addressed by longitudinal research.

Another limitation is that the individual-level environmental variables were all based upon subjective measures of environmental quality. Some research has found that subjective measures of environmental quality are just as robust, if not more so, of predictors of life satisfaction as objective indicators (Diener and Tay 2015; Liao et al. 2014). Nonetheless, future research should incorporate both subjective and objective measures of environmental conditions. One challenge in doing so, however, is that the quality and granularity of such data varies substantially across places. In the case of this study, where some respondents lived in rural areas of developing nations, such data is simply not available or reliable enough to incorporate. On the other hand, this research may be more feasible when focusing on respondents who live in urban areas or more wealthy nations, where local environmental data is more abundant and closely managed.

Finally, the Gallup World Poll is not administered in all participating nations every year. In the case of 2019, no data was collected in China or India. This is a shortcoming as these two nations are the most populous and have two of the largest and most rapidly growing economies in the world. It is important to account for these countries in research relevant to sustainable development. This issue can be addressed by replicating this study with a different year's data or through longitudinal research incorporating all the nations included in the Gallup World Poll.

APPENDIX

APPENDIX

Table 3.5: Country Life Satisfaction Means and Frequencies by World Bank Region

	Mean	*N*		*Mean*	*N*
Sub-Saharan Africa	**4.49**	**26734**	**Europe and Central Asia**	**6.43**	**30377**
Benin	5.19	886	Albania	4.77	995
Burkina Faso	4.85	813	Austria	7.34	973
Cameroon	4.90	843	Azerbaijan	5.17	895
Comoros	5.47	872	Belarus	5.76	873
Congo, Republic of	5.18	920	Belgium	6.88	922
Eswatini	4.39	880	Denmark	7.77	992
Ethiopia	4.00	1994	Estonia	5.92	843
Gabon	4.84	915	Finland	7.88	978
Gambia, The	5.06	952	France	6.80	962
Guinea	4.75	949	Georgia	4.76	900
Ivory Coast	5.23	868	Germany	7.15	951
Kenya	4.63	933	Hungary	5.70	957
Lesotho	3.48	816	Ireland	7.27	947
Liberia	5.15	810	Italy	6.63	990
Madagascar	4.30	894	Kazakhstan	6.16	928
Malawi	3.76	842	Kyrgyzstan	5.67	890
Mali	4.94	1013	Luxembourg	7.48	970
Mauritania	4.43	860	Malta	6.72	962
Mauritius	6.25	913	Moldova	5.60	873
Mozambique	5.40	767	Montenegro	5.25	997
Namibia	4.54	885	Netherlands	7.55	974
Niger	4.94	800	North Macedonia	5.00	970
Rwanda	3.27	933	Norway	7.50	991
Senegal	5.28	843	Portugal	6.39	957
Sierra Leone	3.56	945	Romania	6.02	928
Tanzania	3.49	893	Slovenia	6.67	994
Togo	4.60	938	Spain	6.66	985
Zambia	3.43	805	Sweden	7.50	951
Zimbabwe	2.68	952	Switzerland	7.70	965
			Turkmenistan	5.40	978
East Asia and Pacific	**5.86**	**15687**	Ukraine	4.65	916
Australia	7.35	950	United Kingdom	7.27	970
Cambodia	4.83	825			
Indonesia	5.45	1931	**Latin America and Caribbean**	**6.22**	**9814**
Japan	5.94	860	Argentina	6.09	962
Malaysia	5.40	921	Brazil	6.39	2661
Mongolia	5.66	951	Colombia	6.31	890
Myanmar	4.48	973	Costa Rica	6.94	932
New Zealand	7.45	947	Ecuador	5.83	865
Philippines	6.24	1905	Guatemala	6.15	826
Singapore	6.43	966	Honduras	5.78	841
South Korea	5.76	892	Panama	6.24	966
Thailand	5.90	1833	Peru	5.89	871
Vietnam	5.50	1733			

Table 3.5 (cont'd)

Middle East and North Africa	**5.50**	**7519**	**North America**	**7.26**	**2002**
Iraq	5.17	895	Canada	7.31	994
Iran	4.93	950	United States	7.21	1008
Jordan	4.30	890			
Kuwait	6.04	872	**South Asia**	**5.15**	**5192**
Morocco	4.91	776	Bangladesh	4.98	2641
Saudi Arabia	6.64	973	Maldives	5.23	846
Tunisia	4.33	866	Nepal	5.37	1705
United Arab Emirates	6.91	1297			
			World	**5.66**	**97325**

Source: Gallup (2019)

Table 3.6: Correlation Coefficients Between Dependent and Independent Variables

	Life satis.	Air qual. Satis.	Wtr. qual.	Evn. pres.	Income *	Female	Age	Higher ed.	Emp. part-	Unemp.	Not in labor	Married /partner
Life satis.	1.00											
Air qual. satis.	0.07	1.00										
Wtr. qual. satis.	0.18	0.29	1.00									
Evn. pres. satis.	0.05	0.24	0.20	1.00								
Income*	0.30	0.01	0.15	-0.03	1.00							
Female	0.02	-0.03	-0.01	0.01	-0.06	1.00						
Age	0.07	0.03	0.10	0.00	0.10	0.00	1.00					
Higher ed.	0.19	-0.02	0.07	-0.06	0.29	-0.03	0.45	1.00				
Emp. part-time	-0.02	0.00	-0.03	0.01	-0.09	0.00	-0.06	-0.04	1.00			
Unemp.	-0.07	-0.02	-0.40	-0.02	-0.08	0.01	-0.15	-0.04	-0.12	1.00		
Not in labor force	-0.02	0.00	0.02	0.01	-0.07	0.20	0.26	-0.10	-0.33	-0.20	1.00	
Married/partner	0.03	0.03	0.01	0.05	0.05	-0.01	0.13	0.01	-0.01	-0.07	-0.03	1.00
Div/widow/sep.	-0.05	0.00	0.01	-0.01	-0.06	0.14	0.34	-0.03	-0.02	-0.04	0.13	-0.50
Health prob.	-0.16	-0.04	-0.07	-0.01	-0.17	0.05	0.27	-0.12	0.03	-0.01	0.17	0.00
Carbon inten.*	0.04	-0.07	0.03	-0.09	0.16	-0.01	0.07	0.10	-0.09	-0.02	0.07	0.00
Pct. protect. lands	0.08	0.01	0.03	-0.03	0.07	-0.02	0.07	-0.01	0.01	0.01	-0.03	-0.05
GDP/capita*	0.35	0.04	0.25	-0.02	0.55	-0.02	0.30	0.32	-0.12	-0.08	0.02	-0.01
Mean years edu.	0.30	0.03	0.23	-0.04	0.48	0.01	0.33	0.30	-0.12	-0.08	-0.06	-0.01
Wealth gini	0.10	0.07	0.05	0.03	0.01	0.01	0.00	0.05	0.05	0.00	-0.35	-0.05

Figures refer to Pearson's correlation coefficients; * = variable is logged
Source: Gallup (2019), Bolt and van Zanden (2020), World Bank (2019), World Database on Protected Areas (2018), Roser and Ortiz-Ospina (2017), Credit Suisse Research Institute (2019)

Table 3.6 (cont'd)

	Div/widow/sep.	Health prob.	Carbon inten.*	Pct. protect. lands	GDP/capita*	Mean years edu.	Wealth gini
Div/widow/sep.	1.00						
Health prob.	0.15	1.00					
Carbon inten.*	0.04	-0.01	1.00				
Pct. protect. lands	0.01	-0.01	-0.15	1.00			
GDP/capita*	0.05	-0.13	0.21	0.12	1.00		
Mean years edu.	0.09	-0.09	0.30	0.06	0.88	1.00	
Wealth gini	-0.01	-0.02	-0.01	0.04	0.12	0.06	1.00

Figures refer to Pearson's correlation coefficients; * = variable is logged
Source: Source: Gallup (2019), Bolt and van Zanden (2020), World Bank (2019), World Database on Protected Areas (2018), Roser and Ortiz-Ospina (2017), Credit Suisse Research Institute (2019)

REFERENCES

REFERENCES

Alesina, Alberto, Rafael Di Tella, and Robert MacCulloch. 2004. "Inequality and Happiness: Are Europeans and Americans Different?" *Journal of Public Economics* 88(9-10):2009-2042.

Ambrey, Christopher, and Christopher Fleming. 2014. "Public Greenspace and Life Satisfaction in Urban Australia." *Urban Studies* 51(6):1290-1321.

Anand, Paul. 2016. *Happiness, Well-Being and Human Development*. United Nations Development Programme. Retrieved May 28, 2021 (http://hdr.undp.org/en/content/happiness-well-being-and-human-development).

Batz, Cassondra, and Louis Tay. 2018. "Gender Differences in Subjective Well-Being." In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Beja, Edsel L., Jr. 2018. "The U-Shaped Relationship Between Happiness and Age: Evidence Using World Values Survey Data." *Quality & Quantity* 52:1817-1829.

Berg, Maarten, and Ruut Veenhoven. 2010. "Social Policy and Happiness in Europe." Pp. 174-194 in *Social Policy and Happiness in Europe*, edited by B. Greve. Cheltenham, UK: Edward Elgar.

Bertram, Christine, and Katrin Rehdanz. 2015. "The Role of Urban Green Space for Human Well-Being." *Ecological Economics* 120:139-152.

Blanchflower, David G. 2021. "Is Happiness U-Shaped Everywhere? Age and Subjective Well-Being in 145 Countries." *Journal of Population Studies* 43:575-624.

Blanchflower, David G., and Andrew J. Oswald. 2004. "Well-Being Over Time in Britain and the USA." *Journal of Public Economics* 88(7-8):1359-1386.

Boehm, Julia K. 2018. "Living Healthier and Longer Lives: Subjective Well-Being's Association with Better Health." In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Bolt, Jutta, and Jan Luiten van Zanden. 2020. "Carbon Emission Intensity of Economies, 2018." *Our World in Data*. Retrieved February 20, 2022 (https://ourworldindata.org/grapher/co2-intensity?tab=table&time=2018).

Bonini, Astra N. 2008. "Cross-National Variation in Individual Life Satisfaction: Effects of National Wealth, Human Development, and Environmental Conditions." *Social Indicators Research* 87(2):223-236.

Brulé, Gaël, and Christian Suter. 2019. *Wealth(s) and Subjective Well-Being*. Social Indicators Research Series 76. Cham, Switzerland: Springer Nature.

Cantril, Hadley. 1965. *Pattern of Human Concerns*. New Brunswick, NJ: Rutgers University Press.

Clark, Andrew. 2003. "Inequality-Aversion and Income Mobility: A Direct Test." Working Paper, DELTA.

Clark, Andrew, Andreas Knabe, and Steffen Rätzel. 2010. "Boon or Bane?: Others' Unemployment, Well-Being and Job Insecurity." *Journal of Labour Economics* 17:52-61.

Credit Suisse Research Institute. 2019. *Global Wealth Report 2019*. Zürich, Switzerland: Credit Suisse. Retrieved August 20, 2021 (https://www.credit-suisse.com/cn/en/content-hub/research-institute.html).

Cross, Marie P., Lauren Hofschneider, Mikaela Grimm, and Sarah D. Pressman. 2018. "Subjective Well-Being and Physical Health." In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Dasgupta, Partha. 2001. *Human Well-Being and the Natural Environment*. New York: Oxford University Press.

Diener, Ed, and Robert Biswas-Diener. 2002. "Will Money Increase Subjective Well-Being?" *Social Indicators Research* 57(2):119-169.

Diener, Ed., Richard E. Lucas, and Shigehiro Oishi. 2009. "Subjective Well-Being: The Science of Happiness and Life Satisfaction." Pp. 63-73 in *The Oxford Handbook of Positive Psychology*, Second Edition, edited by S. J Lopez and C. R. Snyder. New York: Oxford University Press.

Diener, Ed, Richard E. Lucas, and Shigehiro Oishi. 2018(a). "Advances and Open Questions in the Science of Subjective Well-Being." *Collabra: Psychology* 4(1):15.

Diener, Ed., Shigehiro Oishi, Richard E. Lucas. 2015. "National Accounts of Subjective Well-Being." *American Psychologist* 70(3):234-242.

Diener, Ed, Shigehiro Oishi, and Louis Tay. 2018(b). "Advances in Subjective Well-Being." *Nature Human Behaviour* 2:253-260.

Diener, Ed, and Martin E. P. Seligman. 2004. "Beyond Money: Toward an Economy of Well-Being." *Psychological Science in the Public Interest* 5(1):1-31.

Diener, Ed., and Louis Tay. 2015. "Subjective Well-Being and Human Welfare Around the World as Reflected in the Gallup World Poll." *International Journal of Psychology* 50(2):135-149.

Diener, Ed. Louis Tay, and Shigehiro Oishi. 2013. “Rising Income and the Subjective Well-Being of Nations.” *Journal of Personality and Social Psychology* 104(2):267-276.

Dietz, Thomas. 2015. “Prolegomenon to a Structural Human Ecology of Human Well-Being.” *Sociology of Development* 1(1):123-148.

Dietz, Thomas, and Andrew K. Jorgenson. 2014. “Towards a New View of Sustainable Development: Human Well-Being and Environmental Stress.” *Environmental Research Letters* 9:031001.

Dietz, Thomas, and Andrew K. Jorgenson. 2015. “Introduction: Progress in Structural Human Ecology.” *Human Ecology Review* 22(1):1-11.

Dietz, Thomas, Eugene A. Rosa, and Richard York, 2009. “Environmentally Efficient Well-Being: Rethinking Sustainability as the Relationship Between Human Well-Being and Environmental Impacts.” *Human Ecology Review* 16(1):114-123.

Dolan, Paul, and Kate Laffan. 2016. “Bad Air Days: The Effects of Air Quality on Direct Measures of Subjective Well-Being.” *Journal of Benefit-Cost Analysis* 7(1):147-195.

Easterlin, Richard A. 1974. “Does Economic Growth Improve the Human Lot? Some Empirical Evidence.” Pp. 89-125 in *Nations and Households in Economic Growth,* edited by P. A. David and M. W. Reder. Cambridge, MA: Academic Press

Easterlin, Richard A. 2013. “Happiness, Growth, and Public Policy.” *Economic Inquiry* 51(1): 1-15.

Engelbrecht, Hans-Jürgen. 2009. “Natural Capital, Subjective Well-Being, and the New Welfare Economics of Sustainability: Some Evidence from Cross-Country Regressions.” *Ecological Economics* 69(2):380-388.

Environmental Performance Index. 2021. “About the EPI”. Retrieved June 25, 2021. (https://epi.yale.edu/about-epi).

Ferrer-i-Carbonell, Ada. 2005. “Income and Well-Being: An Empirical Analysis of the Comparison Income Effect.” *Journal of Public Economics* 89(5-6):997-1019.

Ford, Brett Q., Julia O. Dmitrieva, Daniel Heller, Yulia Chentsova-Dutton, Igor Grossmann, Maya Tamir, Yukkio Uchida, Brigit Koopmann-Holm, Victoria A. Floerke, Meike Uhrig, Tatiana Bokhan, and Iris. B. Mauss. “Culture Shapes Whether the Pursuit of Happiness Predicts Higher or Lower Well-Being.” *Journal of Experimental Psychology: General* 144(6):1053-1062.

Fulmer, C. Ashley, Michele J. Gefand, Arie W. Kruglanski, Chu Kim-Priety, Ed Diener, Antonio Pierro, and E. Troy Higgins. 2010. "On 'Feeling Right' in Cultural Contexts: How Person-Culture Match Affects Self-Esteem and Subjective Well-Being." *Psychological Science* 21(11):1563-1569.

Gallup. 2018. *Worldwide Research: Methodology and Codebook*. Washington, DC: Gallup, Inc.

Gallup. 2019. *Gallup World Poll*. Washington, DC: Gallup, Inc.

Givens, Jennifer E., Xiaorui Huang, and Andrew K. Jorgenson. 2019. "Ecological Unequal Exchange: A Theory of Global Environmental *In*justice." *Sociology Compass* 13(5):e12693.

Global Footprint Network. 2021. "About the Data." Retrieved July 1, 2021 (https://data.footprintnetwork.org/?_ga=2.102617409.1794248821.1639677543-1177900138.1639677543#/abouttheData).

Graafland, Johan, and Bjorn Lous. 2018. "Economic Freedom, Income Inequality and Life Satisfaction in OECD Countries." *Journal of Happiness Studies* 19:2071-2093.

Gundelach, Peter, and Svend Kreiner. 2004. "Happiness and Life Satisfaction in Advanced European Countries." *Cross-Cultural Research* 38(4):359-386.

Headey, Bruce, and Mark Wooden. 2004. "The Effects of Wealth and Income of Subjective Well-Being and Ill-Being." *Economic Record* 80(S1):S24-S33.

Helliwell, John F. 2003. "How's Life? Combining Individual and National Variables to Explain Subjective Well-Being." *Economic Modeling* 20(2):331-360.

Helliwell, John F. 2008. "Life Satisfaction and Quality of Development." Working Paper 14507. Cambridge, MA: National Bureau of Economic Research. Retrieved December 1, 2021 (https://www.nber.org/papers/w14507).

Helliwell, John F., Richard Layard, Jeffrey Sachs, and Jan Emmanuel De Neve. 2020. *World Happiness Report 2020.* New York: Sustainable Development Solutions Network. Retrieved December 1, 2021 (https://worldhappiness.report/ed/2020/).

Hoang, Thi Truong An, and Andreas Knabe. 2021. "Time Use, Unemployment, and Well-Being: An Empirical Analysis Using British Time-Use Data." *Journal of Happiness Studies* 22:252-2548.

Hox, Joop J., Mirjam Moerbeek, and Rens van de Schoot. 2017 *Multilevel Analysis: Techniques and Applications*, Third Edition. New York: Routledge

Jorgenson, Andrew K. 2014. "Economic Development and the Carbon Intensity of Human Well-Being." *Nature Climate Change* 4:186-189.

Jorgenson, Andrew K. 2015. “Inequality and the Carbon Intensity of Human Well-Being.” *Journal of Environmental Studies and Sciences* 5:277-282.

Jorgenson, Andrew K., and Thomas Dietz. 2015. “Economic Growth Does Not Reduce the Ecological Intensity of Human Well-Being.” *Sustainability Science* 10:149-156.

Jorgenson, Andrew K., Thomas Dietz, and Orla Kelly. 2018. “Inequality, Poverty, and the Carbon Intensity of Human Well-Being in the United States: A Sex-Specific Analysis.” *Sustainability Science* 13:1167-1174.

Jorgenson, Andrew K., and Jennifer Givens. 2015. “The Changing Effect of Economic Development on the Consumption-Based Carbon Intensity of Well-Being, 1990-2008.” *PLoS One* 10(5):e0123920.

IBM Corporation. 2021. *SPSS Statistics 28*. Armonk, NY.

International Comparison Program. 2015. *Fundamentals of Purchasing Power Parities*. Washington, DC: The World Bank. Retrieved January 5, 2021. (https://thedocs.worldbank.org/en/doc/332341517441011666-0050022018/original/PPPbrochure2017webformatrev.pdf).

Kahneman, Daniel, and Angus Deaton. 2010. “High Income Improves Evaluation of Life but Not Emotional Well-Being.” *Proceedings of the National Academy of Sciences* 107(38):16489-16493.

Kasser, Tim. 2018. “Materialism and Living Well.” In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Katic, Ivana, and Paul Ingram. 2018. “Income Inequality and Subjective Well-Being: Toward an Understanding of the Relationship and Its Mechanisms.” *Business & Society* 57(6):1010-1044.

Kelly, Orla. 2020. “The Silver Bullet? Assessing the Role of Education for Sustainability.” *Social Forces* 99(1):178-204.

Kelly, Orla, Ryan P. Thombs, and Andrew Jorgenson. 2021. “The Unsustainable State: Greenhouse Gas Emissions, Inequality, and Human Well-Being in the United States, 1913 to 2017.” *Socius: Sociological Research for a Dynamic World* 7:143705.

Lamb, William F., Julia K. Steinberger, Alice Bows-Larkin, Glen Peters, J. Timmons Robert, and Frances Ruth Wood. 2014. “Transitions in Pathways of Human Development and Carbon Emissions.” *Environmental Research Letters* 9(1):014011.

Lawless, Nicole M., and Richard E. Lucas. 2011. “Predictors of Regional Well-Being: A County Level Analysis.” *Social Indicators Research*. 101:347-357.

Liao, Pei-shan, Daigee Shaw, and Yih-min Lin. 2015. “Environmental Quality and Life Satisfaction: Subjective Verses Objective Measures of Air Quality.” *Social Indicators Research* 124:599-616.

Love, Kim. 2020. “R-Squared for Mixed Effects Models.” *The Factor Analysis*. Retrieved February 15, 2022 (https://www.theanalysisfactor.com/r-squared-for-mixed-effects-models/#more-13674).

Lucas, Richard E., Andrew E. Clark, Yannis Georgellis, and Ed Diener. 2003. “Reexamining Adaptation and the Set Point Model of Happiness: Reactions to Changes in Marital Status.” *Journal of Personality and Social Psychology* 84(3):527-539.

Lucas, Richard E., Andrew E. Clark, Yannis Georgellis, and Ed Diener. 2004. “Unemployment Alters the Set Point for Life Satisfaction.” *Psychological Science* 15(1):8-13.

Luechinger, Simon. 2009. “Valuing Air Quality Using the Life Satisfaction Approach.” *The Economic Journal* 119(536):482-515.

Luhmann, Maike, James C. Murdoch, III, and Louise C. Hawkley. 2015. “Subjective Well-Being in Context: County- and State-Level Socioeconomic Factors and Individual Moderators.” *Social Psychological and Personality Science* 6(2):148-156.

Luhmann, Richard E. Lucas, Michael Eid, and Ed Diener. 2013. “The Prospective Effects of Life Satisfaction on Life Events.” *Social Psychological and Personality Science* 4(1):39-45.

Luttmer, Erzo F. P. 2005. “Neighbors as Negatives: Relative Earnings and Well-Being.” *The Quarterly Journal of Economics* 120(3):963-1002.

MacKerron, George, and Susana Mourato. 2013. “Happiness is Greater in Natural Environments.” *Global Environmental Change* 23(5):992-1000.

Martella, Donatella, and Anne Maass. 2006. “Unemployment and Life Satisfaction: The Moderating Role of Time Structure and Collectivism.” *Journal of Applied Social Psychology* 30(5):1098-1108.

Mol, Arthur P. J. 2003. *Globalization and Environmental Reform: The Ecological Modernization of the Global Economy*. Cambridge, MA: MIT Press.

Ng, Weiting, and Ed Diener. 2019. “Affluence and Subjective Well-Being: Does Income Inequality Moderate their Associations?” *Applied Research in Quality of Life* 14: 155-170.

Ngamaba, Kayonda Hubert, Maria Panagioti, and Christopher J. Armitage. 2018. “Income Inequality and Subjective Well-Being: A Systematic Review and Meta-Analysis.” *Quality of Life Research* 27:577-596.

Oishi, Shigehiro, and Selin Kesebir. 2015. “Income Inequality Explains Why Economic Growth Does Not Always Translate to an Increase in Happiness.” *Psychological Science* 26(1): 1630-1638.

Omri, Anis, Henda Omri, Sana Slimani, and Fateh Belaid. 2022. “Environmental Degradation and Life Satisfaction: Do Governance and Renewable Energy Matter?” *Technological Forecasting & Social Change* 175:121375.

Organisation for Economic Co-operation and Development (OECD). 2013. *OECD Guidelines on Measuring Subjective Well-Being*. Paris, France: OECD Publishing.

Organisation for Economic Co-operation and Development (OECD). 2019. *For Good Measure: Advancing Research on Well-Being Metrics Beyond GDP*. Paris, France: OECD Publishing.

Pfeffer, Fabian T., and Nora Waitkus. 2021. “The Wealth Inequality of Nations.” *American Sociological Review* 86(4):567-602.

Roberts, J. Timmons, Julia K. Steinberger, Thomas Dietz, William F. Lamb, Richard York, Andrew K. Jorgenson, Jennifer E. Givens, Paul Baer, and Juliet B. Schor. 2020. “Four Agendas for Research and Policy on Emissions Mitigation and Well-Being.” *Global Sustainability* 3.

Roser, Max, and Esteban Ortiz-Ospina. 2017. “Global Education, Years of Schooling”. *Our World in Data*. Retrieved October 1, 2021 (https://ourworldindata.org/global-education#years-of-schooling).

Røysamb, Espen, Ragnhild Bang Nes, and Joar Vittersø. 2014. “Well-Being: Heritable and Changeable.” Pp. 9-36 in *Stability of Happiness: Theories and Evidence on Whether Happiness Can Change*, edited by K. M. Sheldon and R. E. Lucas. Cambridge, MA: Academic Press.

Rözer, Jesper, and. Gerbert Kraaykamp. 2013. “Income Inequality and Subjective Well-Being: A Cross-National Study on the Conditional Effects of Individual and National Characteristics.” *Social Indicators Research* 113(3):1009-1023.

Sjöberg, Ola. 2010. “Social Insurance as a Collective Resource: Unemployment Benefits, Job Insecurity and Subjective Well-Being in a Comparative Perspective.” *Social Forces* 88(3):1281-1304.

Stevenson, Betsey, and Justin Wolfers. 2008. “Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox.” *Brookings Papers on Economic Activity*, Spring 2008. Retrieved March 1, 2020 (https://www.brookings.edu/bpea-articles/economic-growth-and-subjective-well-being-reassessing-the-easterlin-paradox/).

Stiglitz, Joseph E., Jean-Paul Fitoussi, and Martine Durand. 2019. *Measuring What Counts: The Global Movement for Well-Being*. New York: The New Press.

Stone, Arthur A., and Christopher Mackie. 2013. *Subjective Well-Being: Measuring Happiness, Suffering, and Other Dimensions of Experience*. National Research Council of the National Academies. Washington, DC: The National Academies Press.

Suh, Eunkook M., and Jayoung Koo. 2008. "Comparing Subjective Well-Being Across Cultures and Nations: the 'What' and 'Why' Questions." Pp. 414-430 in *The Science of Subjective Well-Being*, edited by M. Eid and R. J. Larsen. New York: Guildford Press.

Veenhoven, Ruut. 1996. "Happy Life-Expectancy: A Comprehensive Measure of Quality-of-Life in Nations." *Social Indicators Research* 39:1-58.

Veenhoven, Ruut. 2009. "Well-Being *in* Nations and Well-Being *of* Nations: There a Conflict Between Individual and Society?." *Social Indicators Research* 91:5-21.

Verme, Paolo. 2011. "Life Satisfaction and Income Inequality." *Review of Income and Wealth*. 57(1):111-127.

Vemuri, Amanda W., and Robert Costanza. 2006. "The Role of Human, Social, Built, and Natural Capital in Explaining Life Satisfaction at the Country Level: Toward a National Well-Being Index (NWI)." *Ecological Economics* 58(1):119-133.

Vita, Gibran, Edgar G. Hertwich, Konstantin Stadler, and Richard Wood. 2019. "Connecting Global Emissions to Fundamental Human Needs and Their Satisfaction." *Environmental Research Letters* 14:014002.

Welsch, Heinz. 2002. "Preferences over Prosperity and Pollution: Environmental Valuation Based on Happiness Surveys." *Kyklos* 55(4):473-494.

Wilkinson, Richard, and Kate Pickett. 2009. *The Spirit Level: Why Greater Equality Makes Societies Stronger*. New York: Bloomsbery Press.

World Bank. 2016. *CO_2 Emissions (Metric Tons Per Capita)*. Washington, DC: The World Bank. Retrieved January 10, 2021 (https://data.worldbank.org/indicator/EN.ATM.CO2E.PC).

World Bank. 2018. *The World by Region*. Washington, DC: The World Bank. Retrieved June 1, 2021 (https://datatopics.worldbank.org/world-development-indicators/images/figures-png/world-by-region-map.pdf).

World Bank. 2019. *Gross Domestic Product per capita, Purchasing Power Parity (Current International $)*. Washington, DC: The World Bank. Retrieved January 10, 2021 (https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD).

World Database on Protected Areas. 2018. *Terrestrial Protected Areas (% of Total Land Area)*. Washington, DC: The World Bank. Retrieved June 1, 2021. (https://data.worldbank.org/indicator/ER.LND.PTLD.ZS).

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford, U.K.: Oxford University Press.

Yakovlev, Pavel, and Susane Leguizamon. 2012. "Ignorance is Not Bliss: On the Role of Education in Subjective Well-Being." *The Journal of Socio-Economics* 41(6):806-815.

Chapter 4:

Identification with Nature, Race, and Subjective Well-Being

Human beings are inextricably tied to the natural environment. For most our species' history, we have survived as hunter-gathers. The rise of industrial society during the last couple centuries, however, has resulted in more time spent in built environments. Studies have found that the average American now spends at least 90 percent of their time indoors (EPA 2009). This increasing separation from natural environments in favor of built ones has inspired a large scientific literature on the benefits of contact with nature, including spending time outdoors, access to greenspace, and feeling cognitively or emotionally connected to nature, for human well-being (McMahon 2018). Only a small number of these studies, however, specifically addresses subjective well-being (SWB). SWB is a broad term which refers to peoples' evaluations of their own lives as well as the presence and intensity of the positive and negative emotions they experience (Diener, Lucas, and Oishi 2018). As SWB has been receiving increased attention among scholars and policy makers as a useful indicator of human well-being (Stiglitz, Fitoussi, and Durand 2019; Dietz 2015), it seems worthwhile to examine the relationship between our experiences with the natural world and SWB. This is especially true considering present grave environmental problems such as global climate change and biodiversity loss, as well as local challenges. Furthermore, there is a well-documented lack of racial and ethnic diversity in research on the natural environmental and human well-being (Gallegos-Riofrío et al. 2022), as well as research focused on racial or ethnic disparities in SWB (Yoo, Kim, and Lee 2018). These blind spots are problematic as they limit our understanding of human-environment relationships as well as social inequalities in well-being, especially those

influenced by the disproportionate exposure to environmental hazards experienced by racial and ethnic minorities (Gallegos-Riofrío et al. 2022).

In this study, I address these gaps in the literature by drawing upon national survey data to examine the influence of time spent outdoors and cognitive identification with nature on three dimensions of individual SWB: life satisfaction, positive affect, and negative affect. I employed a stratified sampling technique to ensure substantial representation of the U.S.'s two largest racial minority groups, Black Americans and Hispanic/Latinx Americans (U.S. Census Bureau 2021). As part of my analysis, I examined potential differences in cognitive identification with nature between racial and ethnic groups, as well differences in SWB by race and ethnicity. I conclude with a discussion of the implications of this research for sustainable development and its goal of the mutual flourishing of humanity and the rest of the natural world (Dietz 2015).

Background

Subjective Well-Being (SWB)

Over the past few decades, a large literature has developed on SWB, with over 170,000 articles and books on the topic to date (Diener et al. 2018). Its popularity is in part due to the fact it offers an alternative to common economic metrics, such as household income or gross domestic product (GDP), which are frequently, although controversially, employed as measures of well-being (Stiglitz et al. 2019; Kuznets 1934). Criticisms of such measures revolve around the fact that they assume well-being is simply a function of wealth, ignore social inequalities, and do not consider environmental degradation, which can have dire repercussions for long-term well-being (Dietz 2015; Dasgupta 2001). SWB, on the other hand, has been praised for its democratic nature, which allows people to say for themselves how their lives are going, and

because it is reflective of many social factors (Diener, Lucas, and Oishi 2009). Research on the relationship between experiences in nature and SWB is quite limited, however. This area should be explored further for, if significant relationships between experiences in nature, environmental conditions, and SWB are found, then this would have policy implications for sustainable development, which seeks to promote environmental and human well-being simultaneously (Dietz 2015).

Generally, the research on SWB finds a positive influence of income on SWB, particularly life satisfaction (Diener et al. 2018). Married individuals report higher SWB than their single counterparts (Wadsworth 2016; Diener et al. 2000). Studies on age and SWB typically identify a "u-shaped" curve where individual life satisfaction is highest in young and late adulthood, with lower levels though middle age (Blanchflower 2021). The findings regarding age and positive and negative affect are mixed, but a recent large-scale study in the U.S. found that positive affect was similarly u-shaped, while negative affect generally declined across the life course (Stone et al. 2010). Findings on gender differences in SWB are also mixed and when significant, demonstrate low effect sizes (Batz and Tay 2018; Diener et al. 2018). Research has also found a positive direct effect of education on SWB, as well as indirect effects through factors such as higher incomes, higher job satisfaction, and so forth (Kahneman and Deaton 2010; Blanchflower and Oswald 2004).

It seems logical that social scientists would be interested in differences in SWB by race and ethnicity, yet few studies have engaged this topic (Yoo et al. 2018). It may be assumed that ethnic and racial minorities would report lower SWB because of historical patterns of discrimination, but the findings are mixed. Studies using data from the General Social Survey in the U.S. found that, when controlling for factors such as income, education, and marital status,

Blacks reported lower life satisfaction than whites, but this gap has narrowed over the last several decades because of a downward trend in the life satisfaction of whites and an upward trend in the life satisfaction of Blacks (Iceland and Ludwig-Dehm 2019; Blanchflower and Oswald 2004; Yang 2008). Drawing upon data from the Gallup Healthways Index, Tay et al. (2014) found employed Black and Hispanic/Latinx Americans reported higher life satisfaction and positive affect than whites, while Asian Americans reporter both lower life satisfaction and negative affect than whites, controlling for income, age, gender, health, and education. Using data from the National Health and Retirement Study, Tang et al. (2019) found that after controlling for income, education, self-rated health, and engagement in social activities, Blacks reported higher life satisfaction and positive affect than whites, particularly among older age cohorts. The authors assert that this difference was a result of a higher reliance on positive social support among whites. Together, these conflicting results emphasize a need for more examination of how race and ethnicity is related to SWB.

There are also only a limited number of studies which examine how SWB is influenced by experiences in and conditions of the natural environment, although the literature is growing as more scholars and policymakers recognize that SWB could be a useful indicator for sustainable development assessment. Among the first to examine this link was Welsch (2002), who conducted a cross-national study which found a negative relationship between nitrogen dioxide air pollution and country mean life satisfaction, when controlling for other country-level variables such as GDP per capita. Several studies on air pollution and SWB have followed, yielding similar results (Dolan and Laffan 2016; Luechinger 2009). Some studies have also examined how SWB is influenced by time spent in nature as well as identifying with natural world. This research is discussed in the next section.

The Benefits of Nature for Well-Being

Research has consistently identified substantial benefits from exposure to and spending time in natural environments. Studies have found that time spent in nature is associated with lower blood pressure, lower mortality, less prominence of chronic disease, as well as faster recovery from medical procedures (Sandifer et al. 2015; Brown and Grant 2005; Stevens 2010). Numerous mental health benefits have also been identified, including higher self-esteem, and an increased attention span, as well benefits for SWB, including higher life satisfaction, higher positive affect and reduced negative affect (McMahon 2018; Stevens 2010; Biedenweg, Scott, and Scott 2017). Overall, the literature depicts the natural environment as a source of well-being and recovery for humanity which not only provides essential ecosystem services, such as food and water provisioning, but also social, psychological, and even spiritual benefits (Russell et al. 2013). These findings support the frequently cited biophilia hypothesis, which states that people have an innate desire to feel connected to the rest of the natural world (Wilson 1984; Kellert and Wilson 1993)[8]. The theory asserts that since our minds and bodies evolved within natural environments, we feel drawn to them and are most healthy and fulfilled when we feel we are a part of them. Following this logic, time spent in built environments where natural features are strictly controlled or limited is expected to result in feeling disconnected to the natural world and poor mental and physical health outcomes.

The biophilia hypothesis has been very influential in fields such as ecopsychology, which explore how peoples' sense of connectedness to and identification with nature influence their beliefs, behaviors, and sense of well-being (Martin, Stevens, and Martin 2010). Research in this

[8] While the biophilia hypothesis is often attributed to E.O. Wilson, the term "biophilia" was originally coined by social scientist Erich Fromm, whose work laid the foundation for the eventual development of this theory. (See Fromm 2011/1964; Gunderson 2014).

field has found that those who identify more closely with nature are more likely to engage in pro-environmental behaviors such as recycling and reducing energy consumption (Anderson and Krettenauer 2021; Nisbet, Zelenski, and Murphy 2009). Such findings support Aldo Leopold's (1949) argument that feeling connected to nature is essential for combating environmental problems and preventing environmental degradation. This is because as people see themselves more as a part of nature, they see harming nature as a form damaging their own community as well as oneself (Mayer and Frantz 2004). This research has coincided with the development of numerous scales intended to capture various dimensions of identification with nature, including the Nature Relatedness Scale (Nisbet et al. 2009) and the Connectedness to Nature Scale (Mayer and Frantz 2004), to name a few. These scales have been found to measure different, distinct dimensions of peoples' relationships with the natural world, but they are also highly correlated with one another, demonstrating substantial overlap (Mayer and Frantz 2004).

A subset of studies which employ these scales have examined their relationship to individual SWB. For example, Nisbet, Zelenski, and Murphy (2011) found a positive association between the Nature Relatedness scale and positive affect, but no association between the scale and life satisfaction or negative affect. Studies have also found the Connectedness to Nature Scale to be associated with life satisfaction and positive affect (Mayer and Frantz 2004; Mayer et al 2009; Capaldi, Dopko, and Zelenski 2014), although others were unable to replicate these results (Cervinka, Röderer, and Helfer 2012). A shortcoming of these studies, however, is that they relied on small non-representative and non-diverse samples, such as college students. More research which draws upon larger nationally representative samples is needed.

Race, Environment, and SWB

Many scholars have noted that in the U.S., there is a misconception that racial and ethnic minorities are not as concerned for the environment or interested in spending time in it, such as through outdoor recreation, as whites (Taylor 2018; Finney 2014). This stereotype is exacerbated by the historical lack of minority representation in environmental organizations (Taylor 2014). However, research on environmental justice and environmental beliefs and attitudes finds that not only are racial and ethnic minorities at least as concerned about the environment as whites, but that they may be more concerned, especially considering the disproportionate environmental burdens experienced by these groups, as well as a relative lack of access to parks and other natural areas (Pearson et al. 2018; Dietz and Whitley 2018; Macias 2014; Jones and Rainey 2006)

Another factor which contributes to this misconception is the lack of racial and ethnic diversity in research on the relationship between the natural environment and human well-being. In a recent article, Gallegos-Riofrío et al. (2022) conducted a meta-analysis of 174 peer-reviewed studies published from 2010-2020. They found that 62 percent of these studies did not report race or ethnicity and in the case of those that did, the samples were overwhelmingly white. The authors warn that this lack of diversity results in a very limited understanding of human-environment relationships, which undermines the ability to make informed policy decisions regarding sustainable development. This is especially true considering the unique environmental histories of racial and ethnic groups (Finney 2014; Merchant 2007; Johnson 1998).

In this study, I drew upon a diverse nationally representative sample to examine the relationship between time spent outdoors, individuals' identification with nature, and SWB. My intent was to address both the lack of diversity in research on the relationship between the natural

world and human well-being, as well as the lack of representative samples in studies on how identification with the natural environment contributes to SWB. I believe the latter is particularly worth pursuing due the increasing prominence of SWB as a measure of human well-being in both academic and policy circles. Finally, I also address the lack of research on differences in SWB based on race and ethnicity (Yoo et al. 2018).

Data and Methods

Data were collected through a web-based survey conducted through Qualtrics, a private sampling and survey software firm. Qualtrics draws upon their own propriety pool of respondents, as well as those from other organizations, to provide nationally representative online panels (Qualtrics 2014). A stratified sampling technique was deployed to ensure a significant number of respondents were from racial and ethnic minority groups. This consisted of over-sampling for Black and Hispanic/Latinx respondents, who represent the two largest racial and ethnic minority groups in the U.S. (U.S. Census Bureau 2021). The goal was to obtain a sample that was at least 25 percent Black as well as 25 percent Hispanic/Latinx.

The survey was open for a week and half from late October to early November 2020. It closed at the end of the day when the target sample size of 700 was met. A total of 711 responses were collected. Respondents were invited to anonymously participate by email with a unique, personalized link. If they chose to participate, they were required to answer all questions and therefore, there were no missing responses. Respondents of Qualtrics surveys can earn points based upon the length of the surveys they complete, which they can in turn exchange for gift cards for various stores or websites, offers from airlines or hotels, or exchange for cash (Qualtrics 2014). To ensure responses were legitimate, Qualtrics deleted the responses of

participants who finished the survey in less than half of the median survey completion time. I also worked with them to remove any respondents who appeared to have "straight-lined"[9] through survey questions. Institutional Review Board approval is on file at Michigan State University.

Dependent Variables

The dependent variables consisted of three SWB scales, each corresponding to a distinct dimension of SWB. These dimensions were life satisfaction, positive affect, and negative affect. These scales were formed from seven measures of SWB endorsed by the Organisation for Economic Cooperation and Development (OECD). These measures are based on a substantial literature, have been repeatedly employed by large national and cross-national surveys, and have demonstrated cross-cultural validity and reliability (OECD 2013). They assess both cognitive evaluations of life satisfaction as well as positive and negative affect.

The first question asked respondents to indicate their level of satisfaction "with life as a whole these days" on a scale from zero to ten where zero signified "not satisfied at all" and ten signified "completely satisfied". The second question asked respondents to report to what extent they found their life to be worthwhile, also on a scale from zero to ten, where zero implied life was "not at all worthwhile" and ten implied life was "completely worthwhile." Respondents were then asked two questions based on a commonly employed measure called "Cantril's ladder" (see Cantril 1965), in which they were asked to "Imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you." They were then

[9] As in selected the same number across most or all Likert-scale items, suggesting that the respondent was simply trying to complete the survey as fast as possible rather than answer earnestly.

asked to select which step they thought they were on at the time of completing the survey and then again regarding where they thought would stand "about five years from now". Finally, respondents were asked about three emotions they may have experienced the previous day: happiness, worry, and depression. For each, they were asked to indicate on a scale from zero to ten how often they experienced the emotion with zero signifying "none of the time" and ten meaning "all of the time" (10).

The first four questions just mentioned were combined into the life satisfaction scale, which demonstrated high internal consistency (α = 0.88)[10]. Respondents' experienced happiness the previous day was used as the sole measure of positive affect, while the other two affect items, worry and depression experienced the previous day, were combined into the negative affect scale, also exhibiting high internal consistency (α = 0.86).[11]

Independent Variables

The independent variables of greatest theoretical interest were the amount of time respondents spent outdoors on a typical day during the past two weeks (henceforth referred to as time outdoors), their degree of cognitive identification with nature, and their race. Respondents reported whether they typically spent "Less than a half-hour", "More than a half-hour, less than an hour", "1-2 hours", or "More than two hours" outdoors each day, or they could report that they did not go outdoors on a typical day.

Identification with nature was measured by seven questions adopted from Meyer and Frantz's (2004) Connectedness to Nature Scale (CNS). While their original scale consisted of 13

[10] Factor loadings for the life satisfaction scale were 0.78 (satisfied with life), 0.80 (life worthwhile), 0.83 (Cantril's ladder, present), and 0.76 (Cantril's ladder, future).
[11] Factor loadings for the negative affect scale were 0.82 (worry experienced yesterday) and 0.82 (depressed yesterday.

items, the seven items employed in this study were those recommended by Pasca, Aragonés, and Coello (2017), who conducted an analysis of the scale based on item response theory. The seven items they recommend demonstrated strong psychometric properties and formed an internally consistent unidimensional scale. They suggested excluding the other six items from the CNS based upon poor fit and redundancy, resulting in a more concise and better performing scale. For each of the seven questions, respondents were asked to indicate to which extent they agreed with each statement on a five-point Likert-scale where one indicated "strongly disagree" and five indicated "strongly agree". The seven statements were "I feel as though I belong to the Earth as equally as it belongs to me", "I think of the natural world as a community to which I belong", "I often feel part of the web of life", "Like a tree can be part of a forest, I feel embedded within the broader natural world", "I feel that all inhabitants of Earth, human and nonhuman, share a common 'life force'", "When I think of my life, I imagine myself to be part of a large cyclical process of living", and "I often feel a connection with animals and plants." I then combined these seven items into a single scale, which, confirming Pasca et al.'s (2017) analysis, demonstrated high internal consistency (α = 0.91).[12] The items also displayed unidimensionality, as a principal component analysis found one factor accounting for 64 percent of the variance in the data.

For race and ethnicity, respondents were categorized based on their responses as Asian, Black or African American, Hispanic or Latinx, or white. A few respondents who identified as Native American or refused to disclose their race were dropped from the sample. While I acknowledge that the perspectives of Native Americans as well as members of other races are just as important to consider in research on the environment and well-being as those of Asian,

[12] Factor loadings for the Connectedness to Nature Scale ranged from 0.71 to 0.80.

Black, and Hispanic/Latinx individuals, there was not enough of these individuals to include as a separate group in my analysis.

The other independent variables were control variables often found in the literature to be significant predictors of SWB, including gender, age, household income, educational attainment, and relationship status. I included these in the analysis in order to estimate the net effects of race and ethnicity and to minimize the possibility of spuriousness in assessing the effects of time spent outdoors and identification with nature. Four respondents identified as non-binary, who were unfortunately also removed from this study due to insufficient numbers. As with Native Americans, I acknowledge it would be worthwhile to include more of these individuals in future studies. The final sample consisted of 704 individuals.

Sample Characteristics

Tables 4.1 and 4.2 display the final sample characteristics. Table 4.1 shows the descriptive statistics for the continuous variables, including the dependent variables. The mean score on the life satisfaction scale was 7.01 (out of 10), while the mean positive affect (i.e. happiness experienced the previous day) was 6.73 (out of 10). The mean negative affect score was 3.61 (out of 10). The mean age of respondents was around 47 years old while the median was 45.

Table 4.2 displays the descriptive statistics for the categorical variables. About nine percent of respondents reported not spending any time outdoors on a typical day during the previous two weeks. Just over 21 percent of respondents reported spending less than a half hour outdoors on a typical day, while 24.4 percent reported a half hour to less than an hour, and 27.3

reported one to two hours. Around 18 percent of respondents reported spending more than two hours outdoors on a typical day the previous two weeks.

As was intended by the stratified sampling approach, around a quarter of respondents were Black (24.2 percent) while another quarter was Hispanic/Latinx (25.3 percent). Whites accounted for 44 percent of respondents, while Asians accounted for the remaining 6.5 percent. Just under half of respondents were married (47.7 percent), about a third were single (32.2 percent), and the remainder were either living with a partner but not married (7.1 percent), divorced or separated (9.5 percent), or widowed (3.4 percent). Around 13 percent of respondents reported an income of less than $25,000, while 22.7 percent reported $25,000 to $49,000, 19 percent $50,000 to $74,999, 14.6 percent $75,000 to $99,999, 16.7 percent $100,000 to $149,999, and 13.8 percent reported an income of $150,000 or more. Just over twenty percent of respondents had a high school education or less, while about a quarter of respondents attended technical school or had some college experience. About 30 percent had a four-year degree and 23.6 percent held a graduate degree. The sample had slightly more males (51.1 percent) than females.

Table 4.1: Descriptive Statistics for Continuous Variables

	Mean	*Median*	*Std. Dev.*
Life Satisfaction (Scale)	7.01	7.25	1.98
Life satisfaction (0-10, where 10 is completed satisfied)	6.88	7	2.38
Life worthwhile (0-10, where 10 is completely worthwhile)	7.38	8	2.60
Cantril's ladder (0-10, where 10 is best possible life)	6.52	7	2.37
Cantril's ladder future (0-10, where 10 is best possible life)	7.52	8	2.25
α = 0.88			
Positive Affect			
Happy yesterday (0-10, where 10 is all the time)	6.73	7	2.67
Negative Affect (Scale)	3.61	3	3.09
Worried yesterday (0-10, where 10 is all the time)	4.15	4	3.30
Depressed yesterday (0-10, where 10 is all the time)	3.07	2	3.30
α = 0.86			
Nature Connectedness (Scale)	3.52	3.57	0.87
All responses are on a 0-5 scale where 5 is "completely agree"			
"I feel as though I belong to the Earth as equally as it belongs to me."	3.54	4	1.10
"I think of the natural world as a community to which I belong."	3.66	4	1.02
"I often feel part of the web of life."	3.44	3	1.07
"Like a tree can be part of a forest, I feel embedded within the broader natural world."	3.41	3	1.08
"I feel that all inhabitants of the Earth, human and nonhuman, share a common lifeforce."	3.64	4	1.06
"When I think of my life, I imagine myself to be part of a larger cyclical process."	3.51	4	1.12
"I often feel a connection with animals and plants."	3.45	4	1.14
α = 0.91			
Age	46.94	45	18.17

N=704

Table 4.2: Descriptive Statistics for Categorical Variables

	Frequency	*Percentage*		*Frequency*	*Percentage*
Time Spent Outdoors			Income		
None	65	9.2	Less than $25,000	92	13.1
Less than a half-hour	150	21.3	$25,000 to $49,999	160	22.7
Half-hour to less than an hour	172	24.4	$50,000 to $74,999	134	19.0
One to two hours	192	27.3	$75,000 to $99,999	103	14.6
More than two hours	125	17.8	$100,000 to $149,999	118	16.7
Race			$150,000 or more	97	13.8
Asian	46	6.5	Education		
Black	170	24.2	High school or less	145	20.6
Hispanic/Latinx	178	25.3	Technical school /some college	179	25.4
White	310	44.0	Four-year degree	214	30.4
Marital Status			Graduate degree	166	23.6
Single	227	32.2	Gender		
Married	336	47.7	Male	360	51.1
Living with a partner, not married	50	7.1	Female	344	48.9
Divorced or separated	67	9.5			
Widowed	24	3.4			

N=704

Analysis

The analysis for this study consisted of two phases. First, since I sought to explore how experiences with nature may vary between racial and ethnic groups, I examined whether there were differences in mean CNS scores by race and ethnicity. To do so, I ran a one-way ANOVA test. For the second phase, I used ordinary least squares (OLS) regression to regress each of the three SWB dimensions (life satisfaction, positive affect, and negative affect) on the independent variables. All these analyses were conducted using Stata SE version 16.1 (StataCorp 2019). The

highest variance inflation factor (vif) in any of the regression models was 1.97. Diagnostics did not reveal any significant violations of the model assumptions. A correlation matrix including Pearson's correlation coefficients between all dependent and independent variables is displayed in Table 4.4 of the appendix of this chapter. Finally, while not discussed further, I regressed each of the seven SWB variables on the independent variables. The results for this analysis are displayed in Tables 4.5 and 4.6 in the appendix.

Results and Discussion

ANOVA Results

The ANOVA test which examined differences in mean CNS scores between the racial and ethnic groups was not significant. This is a notable finding considering the common misconception that white individuals are more interested in or identify more with than natural world than racial or ethnic minorities (Pearson et al. 2018; Finney 2014). It is also interesting because it demonstrates that despite the disproportionately higher exposure to environmental burdens as well as less access to healthy, natural environments that racial and ethnic minority groups are often subject to, these experiences have not resulted in less identification with the natural world. The fact that no significant differences in CNS scores were observed lends support to the CNS as a universal measure of identification with nature, at least in the U.S. context, rather than a measure which simply reflects the conceptions of nature held by a particular racial and ethnic group.

OLS Regression Results

Table 4.3 displays the OLS regression results. In agreement with previous studies (Mayer and Frantz 2004; Capaldi et al. 2014), respondents with higher scores on the CNS reported higher life satisfaction and positive affect, on average, controlling for the other variables. Interestingly, they also reported higher negative affect. This finding does not have empirical support from previous studies, but some scholars have theorized that those who see themselves as closely connected to nature may view harm done to nature as harm done to oneself. Considering the large-scale negative impacts of climate change which are expected to only worsen, it seems likely that those who more closely identify with nature will experience increased negative affect (Capaldi et al. 2014; Doherty and Cayton 2011). This hypothesis is supported by numerous studies which found that the threat of as well as current problems related to climate change are a source of worry and depression (Maibach, Roser-Renouf, and Leiserowitz 2009; Clayton and Karazsia 2020; Searle and Gow 2010)

Respondents who spent more time outdoors also generally reported higher life satisfaction and positive affect, controlling for the other variables. It appears that particular time thresholds emerged at which respondents began reporting these higher scores. Specifically, those who spent at least a half-hour to less than an hour outdoors on a typical day demonstrated significantly higher life satisfaction than those who did not spend any time outdoors, while those who reported spending at least one to two hours outdoors reported higher positive affect than respondents who did not spent time outdoors. There was no significant effect of spending less than those amounts of time outdoors on life satisfaction or positive affect compared to respondents who did not go outside. Time spent outdoors was not a significant predictor of negative affect, in contrast to findings of many other studies (McMahon 2018; Stevens 2010).

In agreement with Tay et al. (2014) and Tang et al. (2019), I found that Blacks Americans demonstrated both higher life satisfaction and positive affect than whites when controlling for the other variables. No other significant effects of race and ethnicity were observed. Age was positively associated with positive affect and negatively associated with negative affect, controlling for the other variables, although these effects appeared very small. Respondents with higher household incomes reported higher life satisfaction, but not positive or negative affect. This supports the findings of Kahneman and Deaton (2010), among others, that income is more closely related to life satisfaction than affective well-being.

Respondents with graduate degrees reported higher life satisfaction and positive affect than those with a high school education or less, controlling for the other variables. Finally, married individuals demonstrated higher life satisfaction and positive affect compared to single individuals. However, they also demonstrated higher negative affect, suggesting that marriage can be both emotionally rewarding as well as a source of stress and anxiety.

Table 4.3: OLS Regression Results for SWB Scales

	Life Satisfaction	Positive Affect	Negative Affect
Intercept	3.632 (0.412)***	2.404 (0.568)***	5.443 (0.648)***
Nature connectedness	0.339 (0.081)***	0.495 (0.112)***	0.437 (0.128)**
Time spent outdoors (vs. no time)			
Less than a half-hour	0.137 (0.267)	0.089 (0.368)	0.446 (0.420)
Half-hour to less than an hour	0.844 (0.271)**	0.709 (0.373)	0.516 (0.425)
One to two hours	1.115 (0.269)***	1.144 (0.372)**	-0.343 (0.424)
More than two hours	1.164 (0.287)***	1.467 (0.395)***	-0.219 (0.451)
Race/Ethnicity (vs. white)			
Asian	0.020 (0.285)	0.329 (0.392)	-0.313 (0.448)
Black	0.965 (0.186)***	0.912 (0.256)***	-0.557 (0.292)
Hispanic/Latinx	0.102 (0.171)	-0.098 (0.236)	-0.325 (0.269)
Female (vs male)	0.164 (0.144)	0.213 (0.198)	-0.307 (0.226)
Age	0.005 (0.005)	0.014 (0.006)*	-0.071 (0.007)***
Income (vs. less than $25k)			
$25,000-$49,999	0.168 (0.236)	0.079 (0.325)	-0.136 (0.371)
$50,000-$74,999	0.516 (0.254)*	0.238 (0.351)	-0.576 (0.400)
$75,000-$99,999	0.596 (0.280)*	0.624 (0.386)	-0.430 (0.440)
$100,000 to $149,999	0.742 (0.285)**	0.698 (0.393)	0.412 (0.448)
$150,000 or more	0.653 (0.304)*	0.264 (0.420)	-0.496 (0.478)
Education (vs. high school or less)			
Some college/tech school	-0.036 (0.204)	-0.156 (0.282)	0.493 (0.321)
Four-year degree	-0.016 (0.213)	0.096 (0.293)	0.092 (0.334)
Graduate degree	0.528 (0.230)*	0.649 (0.317)*	-0.046 (0.362)
Relationship status (vs. single)			
Married	0.534 (0.186)**	0.723 (0.257)**	0.772 (0.293)*
Living with a partner	0.133 (0.284)	-0.058 (0.391)	0.245 (0.446)
Divorced or separated	0.210 (0.268)	0.472 (0.369)	0.577 (0.421)
Widowed	0.577 (0.403)	0.621 (0.556)	0.549 (0.634)
Adjusted R^2	0.213	0.176	0.203

N=704; Unstandardized regression coefficients (standard error); *p<.05 **p<.01 ***p<.001

Conclusion

Scholars and policymakers have demonstrated increasing interest in SWB as a measure of human well-being (Stiglitz et al. 2019; Diener, Oishi, and Lucas 2015). While this has inspired a large body of research on SWB, studies have generally not considered the influence of experiences in and identification with the natural world on individual SWB. Furthermore, the few studies which have largely draw upon small, non-representative samples. In this study, I addressed these shortcomings by employing a nationally representative sample to explore the relationship between time spent outdoors, peoples' identification with the natural world, and their SWB. I also addressed the lack of racial and ethnic diversity in both research on how the natural environment is related to well-being (Gallegos-Riofrío et al. 2022), as well as research on SWB in general (Yoo et al. 2018). To do so, I employed a stratified sampling technique to ensure a quarter of respondents identified as Black and another quarter identified as Hispanic/Latinx. I chose to over-sample for these groups as they represent the two largest minority racial and ethnic groups in the U.S.

Considering the relationship between experiences in the natural world and SWB is important because if individual SWB is influenced by experiences in nature as well as environmental conditions, then this establishes a clear link between human and environmental well-being. This link is core to the concept of sustainable development, which emphasizes the mutual flourishing of humans and the rest of the natural environment (Dietz 2015) and is exemplified by the United Nation's Sustainable Development Goals, which were adopted by the UN's general assembly in 2015. These goals promote both human well-being, such as through reducing poverty, increasing education, and gender equality, as well as environmental well-being through climate action and protecting biodiversity (United Nations Development Programme

2022). While many scholars note that there are many potential trade-offs which need to be made in the pursuit of mutual human and environmental well-being (Pradhan et al. 2017; De Neve and Sachs 2020), the findings from this study suggest that preserving the environment will help preserve the positive effects of experiences in nature on SWB, suggesting that pathways for mutual flourishing are possible and must be pursued.

Specifically, I found that individuals who spend more time outdoors as well as more closely identified with the natural environment, as measured by the CNS, demonstrated higher life satisfaction and positive affect, controlling for the other independent variables such as income, race, and marital status. I also found that those who identified more closely with nature reported more negative affect, an interesting finding for which I did not find support for in the existing literature, but which seems plausible considering studies which found that environmental problems such as climate change can result in feelings of anxiety and depression (Maibach, Roser-Renouf, and Leiserowitz 2009; Clayton and Karazsia 2020; Searle and Gow 2020). Furthermore, the biophilia hypothesis, as well as studies on how people cognitively and emotionally identify with nature, suggest that people who closely identify with the natural world will feel personally harmed by environmental degradation, as the community they value being a part of is at risk (Wilson 1984; Mayer and Frantz 2004)

I also examined differences in how closely individuals identified with the natural world based on race and ethnicity, but no significant differences emerged. This is a noteworthy finding because it further dispels the common misconception that racial and ethnic minorities feel less connected to nature (Taylor 2018; Finney 2014; Pearson et al. 2018). It also suggests that measures such as the CNS may have some cross-cultural validity, at least in the U.S. context, as the Asian, Black, and Hispanic/Latinx respondents reported similar CNS scores as whites.

While no apparent differences in identification with nature based on race or ethnicity emerged, I did observed differences in SWB. Specifically, Blacks reported both higher life satisfaction and positive affect compared to whites. This finding was unexpected, considering the historical patterns of discrimination which Black Americans have been subjected to throughout U.S. history. However, these findings agree with some recent studies (Tang et al. 2019; Tay et al. 2014). Future studies should further examine differences in SWB based upon race and ethnicity and consider other racial and ethnic groups, such as Native Americans, who are specifically mentioned by both Yoo et al. (2018) and Gallegos-Riofrío et al. (2022) as an understudied group. Qualitative work could be especially helpful in understanding the mechanisms behind differences in both SWB as well as experiences in and identification with nature between racial and ethnic groups.

As is often the case with cross-sectional studies, a major limitation of this research is that it cannot establish the strong evidence of causality that longitudinal research can. As other studies on SWB note, it is important to consider reverse causality. For example, while studies have found that married individuals tend to report higher SWB than single individuals, some have also found that individuals with higher SWB are more likely to get married as well as stay married (Lucas et al. 2003; Luhmann et al. 2013). Extending this logic to this study, it may be possible that having higher SWB contributes to identifying more closely to nature as well as spending more time outdoors. Therefore, longitudinal research is needed to appropriately establish the causal direction(s) present in these relationships.

Another significant limitation is that I did not collect data on respondents' occupation. This is a shortcoming as many of the respondents who reported spending the most time outdoors may have done so because their jobs required them to. Differentiating between those who spend

time outdoors for leisure activities and those who are outdoors for work purposes is likely important to account for as their experiences may differ regarding whether they increase or reduce SWB.

APPENDIX

Table 4.4: Correlation Coefficients Between Dependent and Independent Variables

	Life satis.	Pos. affect	Neg. affect	CNS	Time outdoors*	Asian	Black	Hispn/Latinx	Female	Age	Income*	Some col/tech.	Col. degree	Grad/ Profess.	Married	N. mar., w/ ptnr.	Div/sep.	Widowed
Life satis.	1.00																	
Pos. affect	0.73	1.00																
Neg. affect	-0.24	-0.30	1.00															
CNS	0.22	0.22	0.14	1.00														
Time outdoors	0.30	0.27	-0.06	0.25	1.00													
Asian	-0.07	-0.02	0.04	-0.06	-0.12	1.00												
Black	0.20	0.17	-0.23	-0.05	0.04	-0.15	1.00											
Hispn/Latinx	-0.05	-0.08	0.06	0.10	0.03	-0.15	-0.33	1.00										
Female	0.01	0.02	-0.11	-0.02	-0.17	0.09	0.19	-0.22	1.00									
Age	0.19	0.21	-0.41	-0.05	0.10	-0.13	0.38	-0.15	0.14	1.00								
Income	0.23	0.18	0.04	0.05	0.12	0.04	-0.15	-0.05	-0.15	0.05	1.00							
Some col/tech.	-0.04	-0.05	-0.06	-0.01	0.04	-0.02	0.13	-0.02	0.11	0.12	-0.24	1.00						
Col. degree	0.00	0.03	0.04	0.05	0.04	0.04	-0.10	-0.03	-0.13	0.04	0.18	-0.39	1.00					
Grad/profess.	0.18	0.15	0.00	0.05	0.02	0.07	-0.06	-0.06	-0.03	0.00	0.36	-0.32	-0.37	1.00				
Married	0.25	0.23	0.03	0.10	0.21	-0.06	-0.10	0.03	-0.13	0.19	0.48	-0.09	0.14	0.17	1.00			
N. mar, w/ptnr.	-0.05	-0.07	0.03	0.05	0.02	-0.03	-0.10	0.09	-0.02	-0.10	-0.08	-0.02	-0.05	0.03	-0.26	1.00		
Div/sep.	-0.01	0.03	-0.10	0.03	-0.06	-0.01	0.15	-0.09	0.15	0.24	-0.17	0.13	-0.04	-0.05	-0.31	-0.09	1.00	
Widowed	0.02	0.02	-0.09	-0.04	-0.07	-0.02	0.11	-0.04	0.08	0.22	-0.06	0.05	-0.04	-0.05	-0.18	-0.52	-0.06	1.00

Figures refer to Pearson's correlation coefficients

*Time outdoors and income were treated as continuous variables for this correlation analysis. Responses for time outdoors ranged from 1-5, with each value referring to one of the response categories ranging from no time spent outdoors on a typical day during the past two weeks (1) to spending more than two hours outdoors on a typical day during the past two weeks (5). For income, these categories ranged from 1-6, with "1" signifying an income of less than $25,000 per year and "6", signifying an income of $150,000 or more.

Table 4.5: OLS Regression Results for Individual Life Satisfaction SWB Measures

	Life Satisfaction	Life Worthwhile	Cantril's Ladder (Now)	Cantril's Ladder (Future)
Intercept	4.685 (0.515)***	4.085 (0.486)***	2.123 (0.491)***	3.634 (0.486)***
Nature connectedness	0.333 (0.102)**	0.300 (0.096)**	0.326 (0.097)**	0.398 (0.096)***
Time spent outdoors (vs. no time)				
Less than a half hour	-0.330 (0.334)	0.117 (0.315)	0.200 (0.316)	0.559 (0.315)
Half hour to less than an hour	0.418 (0.338)	0.785 (0.319)*	0.881 (0.323)**	1.291 (0.319)***
One to two hours	0.791 (0.337)*	0.996 (0.318)**	1.107 (0.321)**	1.567 (0.318)***
More than two hours	0.821 (0.287)*	1.146 (0.338)**	1.042 (0.342)**	1.645 (0.338)***
Race (vs. white)				
Asian	0.024 (0.356)	0.126 (0.335)	0.034 (0.339)	-0.105 (0.335)
Black	1.012 (0.232)***	1.248 (0.219)***	0.738 (0.221)**	0.865 (0.219)***
Hispanic/Latinx	0.137 (0.214)	0.305 (0.202)	-0.064 (0.204)	0.029 (0.202)
Female (vs male)	-0.025 (0.180)	0.103 (0.170)	0.210 (0.172)	0.378 (0.170)
Age	-0.007 (0.006)	0.010 (0.005)	0.017 (0.006)**	0.001 (0.005)
Income (vs. less than $25k)				
$25,000-$49,999	0.024 (0.295)	0.095 (0.278)	0.401 (0.281)	0.153 (0.278)
$50,000-$74,999	0.305 (0.318)	0.442 (0.300)	0.882 (0.303)**	0.437 (0.300)
$75,000-$99,999	0.412 (0.350)	0.576 (0.330)	0.741 (0.334)*	0.656 (0.330)*
$100,000 to $149,999	0.671 (0.357)	0.623 (0.336)	1.055 (0.340)**	0.621 (0.336)
$150,000 or more	0.587 (0.380)	0.604 (0.358)	0.979 (0.362)**	0.442 (0.358)
Education (vs. high school or less)				
Some college/tech school	-0.523 (0.256)*	0.090 (0.241)	0.340 (0.244)	-0.050 (0.241)
Four-year degree	-0.240 (0.266)	-0.120 (0.251)	0.396 (0.253)	-0.098 (0.250)
Graduate degree	0.236 (0.288)*	0.304 (0.271)	1.001 (0.274)***	0.572 (0.271)*
Marital status (vs. single)				
Married	0.871 (0.233)***	0.414 (0.219)	0.615 (0.222)**	0.236 (0.219)
Living with a partner	0.447 (0.355)	-0.358 (0.334)	0.037 (0.338)	0.410 (0.334)
Divorced or separated	0.144 (0.335)	0.326 (0.315)	0.070 (0.319)	0.302 (0.315)
Widowed	1.233 (0.504)***	0.313 (0.475)	0.629 (0.481)	0.131 (0.475)
Adjusted R^2	0.146	0.160	0.217	0.153

N=704; Unstandardized regression coefficients (standard error); *p<.05 **p<.01 ***p<.001

Table 4.6: OLS Regression Results for Individual Affective SWB Measures

	Happy Yesterday	Worried Yesterday	Depressed Yesterday
Intercept	2.404 (0.568)***	5.365 (0.695)***	5.521 (0.706)***
Nature connectedness	0.495 (0.112)***	0.527 (0.137)***	0.348 (0.139)*
Time spent outdoors (vs. no time)			
Less than a half hour	0.089 (0.368)	0.607 (0.450)	0.285 (0.458)
Half hour to less than an hour	0.709 (0.373)	0.630 (0.456)	0.402 (0.464)
One to two hours	1.144 (0.372)**	-0.163 (0.454)	-0.523 (0.461)
More than two hours	1.467 (0.395)***	-0.158 (0.483)	-0.281 (0.491)
Race (vs. white)			
Asian	0.329 (0.392)	-0.462 (0.480)	-0.164 (0.487)
Black	0.912 (0.256)***	-0.719 (0.313)*	-0.395 (0.318)
Hispanic/Latinx	-0.098 (0.236)	-0.343 (0.289)	-0.306 (0.293)
Female (vs male)	0.213 (0.198)	-0.056 (0.243)	-0.558 (0.246)
Age	0.014 (0.006)*	-0.072 (0.008)***	-0.071 (0.008)***
Income (vs. less than $25k)			
$25,000-$49,999	0.079 (0.325)	0.067 (0.398)	-0.340 (0.404)
$50,000-$74,999	0.238 (0.351)	-0.500 (0.429)	-0.652 (0.435)
$75,000-$99,999	0.624 (0.386)	-0.467 (0.472)	-0.394 (0.479)
$100,000 to $149,999	0.698 (0.393)	0.260 (0.481)	0.563 (0.488)
$150,000 or more	0.264 (0.420)	-0.526 (0.512)	-0.466 (0.520)
Education (vs. high school or less)			
Some college/tech school	-0.156 (0.282)	0.022 (0.345)	0.077 (0.350)
Four-year degree	0.096 (0.293)	0.172 (0.358)	0.011 (0.364)
Graduate degree	0.649 (0.317)*	0.101 (0.388)	-0.193 (0.394)
Marital status (vs. single)			
Married	0.723 (0.257)**	0.891 (0.314)**	0.554 (0.319)
Living with a partner	-0.058 (0.391)	0.221 (0.478)	0.287 (0.486)
Divorced or separated	0.472 (0.369)	0.450 (0.451)	0.703 (0.458)
Widowed	0.621 (0.556)	0.145 (0.680)	0.953 (0.690)
Adjusted R^2	0.176	0.194	0.167

N=704; Unstandardized regression coefficients (standard error); *p<.05 **p<.01 ***p<.001

REFERENCES

REFERENCES

Anderson, Daniel J., and Tobias Krettenauer. 2021. "Connectedness to Nature and Pro-Environmental Behaviour from Early Adolescence to Adulthood: A Comparison of Urban and Rural Canada." *Sustainability* 31(7):3655.

Batz, Cassondra, and Louis Tay. 2018. "Gender Differences in Subjective Well-Being." In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Biedenweg, Kelly, Ryan P. Scott, and Tyler A. Scott. 2017. "How Does Engaging with Nature Relate to Life Satisfaction? Demonstrating the Link Between Environment-Specific Social Experiences and Life Satisfaction." *Journal of Environmental Psychology* 50: 112-124.

Blanchflower, David G. 2021. "Is Happiness U-Shaped Everywhere? Age and Subjective Well-Being in 145 Countries." *Journal of Population Studies* 43:575-624.

Blanchflower, David G., and Andrew J. Oswald. 2004. "Well-Being Over Time in Britain and the USA." *Journal of Public Economics* 88(7-8):1359-1386.

Brown, Caroline, and Marcus Grant. 2005. "Biodiversity and Human Health: What Role for Nature in Healthy Urban Planning?" *Built Environment* 31(4):326-338.

Capaldi, Colin A., Raelyne L. Dopko, and John M. Zelenski. 2014. "The Relationship Between Nature Connectedness and Happiness: A Meta-Analysis." *Frontiers in Psychology* 5:976.

Cantril, Hadley. 1965. *Pattern of Human Concerns*. New Brunswick, NJ: Rutgers University Press.

Cervinka, Renate, Kathrin Röderer, and Elisabeth Hefler. 2012. "Are Nature Lovers Happy? On Various Indicators of Well-Being and Connectedness with Nature." *Journal of Health Psychology* 17(3):379-388.

Clayton, Susan, and Bryan T. Karazsia. 2020. "Development and Validation of a Measure of Climate Change Anxiety." *Journal of Environmental Psychology* 69:101434.

Dasgupta, Partha. 2001. *Human Well-Being and the Natural Environment*. New York: Oxford University Press.

De Neve, Jan-Emmanuel, and Jeffery D. Sachs. 2020. "The SDGs and Human Well-Being: A Global Analysis of Synergies, Trade-offs, and Regional Differences." *Scientific Reports* 10:15113.

Diener, Ed. Carol L. Gohm, Eunkook Suh, and Shigehiro Oishi. 2000. “Similarity of the Relations Between Marital Status and Subjective Well-Being Across Cultures.” *Journal of Cross-Cultural Psychology* 31(4): 419-436.

Diener, Ed., Richard E. Lucas, and Shigehiro Oishi. 2009. “Subjective Well-Being: The Science of Happiness and Life Satisfaction.” Pp. 63-73 in *The Oxford Handbook of Positive Psychology,* Second Edition, edited by S. J Lopez and C. R. Snyder. New York: Oxford University Press.

Diener, Ed, Richard E. Lucas, and Shigehiro Oishi. 2018. “Advances and Open Questions in the Science of Subjective Well-Being.” *Collabra: Psychology* 4(1):15.

Diener, Ed., Shigehiro Oishi, Richard E. Lucas. 2015. “National Accounts of Subjective Well-Being.” *American Psychologist* 70(3):234-242.

Dietz, Thomas. 2015. “Prolegomenon to a Structural Human Ecology of Human Well-Being.” *Sociology of Development* 1(1):123-148.

Dietz, Thomas, and Cameron T. Whitley. 2018. “Environmentalism, Norms, and Identity.” *Proceedings of the National Academy of Sciences* 115(49):12334-36.

Doherty, Thomas J., and Susan Clayton. 2011. “The Psychological Impacts of Global Climate Change.” *American Psychologist* 66(4):265-276.

Dolan, Paul, and Kate Laffan. 2016. “Bad Air Days: The Effects of Air Quality on Direct Measures of Subjective Well-Being.” *Journal of Benefit-Cost Analysis* 7(1):147-195.

Finney, Carolyn. 2014. *Black Faces, White Spaces: Reimagining the Relationship of African Americans to the Great Outdoors*. Chapel Hill, NC: The University of North Carolina Press.

Fromm, Erich. 2011/1964. *The Heart of Man: Its Genius for Good and Evil*. New York, NY: Lantern Books.

Gallegos-Riofrío, Carlos Andres, Hassan Arab, Amaya Carrasco-Torrontegui, and Rachelle K. Gould. 2022. “Chronic Deficiency of Diversity and Pluralism in Research on Nature’s Mental Health Effects: A Planetary Health Problem.” *Current Research in Environmental Sustainability* 4:100148.

Gunderson, Ryan. 2014. “Erich Fromm’s Ecological Messianism: The First Biophilia Hypothesis as Humanistic Social Theory.” *Humanity & Society* 2014 38(2):182-204.

Iceland, John, and Sarah Ludwig-Dehm. 2019. “Black-White Differences in Happiness, 1972-2014.” *Social Science Research* 77:16-29.

Johnson, Cassandra Y. 1998. “A Consideration of Collective Memory in African American Attachment to Wildland Recreation Places.” *Human Ecology Review* 5(1):5-15.

Jones, Robert Emmet, and Shirley A. Rainey. 2006. “Examining Linkages between Race, Environmental Concern, Health, and Justice in a Highly Polluted Community of Color.” *Journal of Black Studies* 36(4):473-496.

Kahneman, Daniel, and Angus Deaton. 2010. “High Income Improves Evaluation of Life but Not Emotional Well-Being.” *Proceedings of the National Academy of Sciences* 107(38):16489-16493.

Kellert, Stephen R., and Edward O. Wilson. 1993. *The Biophilia Hypothesis*. Washington, DC: Island Press.

Kuznets, Simon. 1934. *National Income, 1929-1932*. Cambridge, MA: National Bureau of Economic Research. Retrieved August 17, 2022 (https://www.nber.org/system/files/chapters/c2258/c2258.pdf).

Leopold, Aldo. 1949. *A Sand County Almanac and Sketches Here and There*. New York, NY: Oxford University Press.

Lucas, Richard E., Andrew E. Clark, Yannis Georgellis, and Ed Diener. 2003. “Reexamining Adaptation and the Set Point Model of Happiness: Reactions to Changes in Marital Status.” *Journal of Personality and Social Psychology* 84(3):527-539

Luechinger, Simon. 2009. “Valuing Air Quality Using the Life Satisfaction Approach.” *The Economic Journal* 119(536):482-515.

Luhmann, Maike, Richard E. Lucas, Michael Eid, and Ed Diener. 2013. “The Prospective Effects of Life Satisfaction on Life Events.” *Social Psychological and Personality Science* 4(1):39-45.

Macias, Thomas. 2014. “Ecological Assimilation: Race, Ethnicity, and the Inverted Gap of Environmental Concern.” *Society & Natural Resources* 29(1):3-19.

Maibach, Edward, Connie Roser-Renouf, and Anthony Leiserowitz. 2009. *Global Warming’s Six Americas 2009: An Audience Segmentation Analysis*. New Haven, CT, and Fairfax, VA: Yale Project on Climate Change and George Mason University Center for Climate Change. Retrieved July 20, 2022 (https://cdn.americanprogress.org/wp-content/uploads/issues/2009/05/pdf/6americas.pdf).

Martin, Jordan, Paul Stevens, and Martin Milton. 2010. “Editorial—Ecopsychology: Past, Present, and Future.” *European Journal of Ecopsychology* 1:1-3.

Mayer, Stephan F., and Cynthia McPherson Frantz. 2004. “The Connectedness to Nature Scale: A Measure of Individuals’ Feeling in Community with Nature.” *Journal of Environmental Psychology* 24:503-515.

Meyer, Stephan F., Cynthia McPherson Frantz, Emma Bruehlman-Senecal, and Kyffin Dolliver. 2009. “Why is Nature Beneficial? The Role of Connectedness to Nature.” *Environment and Behavior* 41(5):607-643.

Merchant, Carolyn. 2007. *American Environmental History: An Introduction*. New York: Columbia University Press.

McMahan, Ethan A. 2018. “Happiness Comes Naturally: Engagement with Nature as a Route to Positive Subjective Well-Being.” In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

Nisbet, Elizabeth K., John M. Zelenski, and Steve A. Murphy. 2009. “The Nature Relatedness Scale: Linking Individuals’ Connection with Nature to Environmental Concern and Behavior.” *Environment and Behavior* 41(5):715-740.

Nisbet, Elizabeth K., John M. Zelenski, and Steven A. Murphy. 2011. “Happiness is in Our Nature: Exploring Nature Relatedness as a Contributor to Subjective Well-Being.” *Journal of Happiness Studies* 12:303-322.

Organisation for Economic Co-operation and Development (OECD). 2013. *OECD Guidelines on Measuring Subjective Well-Being*. Paris, France: OECD Publishing.

Pasca, Laura, Juan I. Aragonés, and María T. Coello. 2017. “An Analysis of the Connectedness to Nature Scale Based on Item Response Theory.” *Frontiers in Psychology* 8:1330.

Pearson, Adam R., Jonathon P. Schuldt, Rainer Romero-Canyas, and Dylan Larson-Konar. 2018. “Diverse Segments of the US Public Underestimate the Environmental Concerns of Minority and Low-Income Americans.” *Proceedings of the National Academy of Sciences* 115(49):12429-12434.

Pradhan, Prajal, Luís Costa, Diego Rybski, Wolfgang Lucht, and Jürgen P. Kropp. 2017. “A Systematic Study of Sustainable Development Goal (SDG) Interactions.” *Earth’s Future* 5:1169-1179.

Qualtrics. 2014. *ESOMAR 28: 28 Questions to Help Research Buys of Online Samples*. Provo, UT: Qualtrics.

Russell, Roly, Anne D. Guerry, Patricia Balvanera, Rachelle K. Gould, Xavier Basurto, Kai M. A. Chan, Sarah Klain, Jordan Levine, and Jordan Tam. 2013. “Humans and Nature: How Knowing and Experiencing Nature Affect Well-Being.” *Annual Review of Environment and Resources 38:473-502.*

Sandifer, Ariana E. Sutton-Grier, Bethney P. Ward. 2015. “Exploring Connections Among Nature, Biodiversity, Ecosystem Services, and Human Health and Well-Being: Opportunities to Enhance Health and Biodiversity Conservation.” *Ecosystem Services* 12:1-14.

Searle, Kristina, and Kathryn Gow. 2020. “Development and Validation of a Measure of Climate Change Anxiety.” *Journal of Environmental Psychology* 69:101434.

StataCorp. 2019. *Stata SE 16.1*. College Station, TX.

Stevens, Paul. 2010. “Embedment in the Environment: A New Paradigm for Well-Being?”. *Perspectives in Public Health* 130(6):265-269.

Stiglitz, Joseph E., Jean-Paul Fitoussi, and Martine Durand. 2019. *Measuring What Counts: The Global Movement for Well-Being*. New York: The New Press.

Stone, Arthur A., Joseph E. Schwartz, Joan E. Broderick, and Angus Deaton. 2010. “A Snapshot of the Age Distribution of Psychological Well-Being in the United States.” *Proceedings of the National Academy of Sciences* 107(22):9985-9990.

Tang, Fengyan, Heejung Jang, Mary Beth Rauktis, Donald Musa, and Scott Beach. 2019. “The Race Paradox in Subjective Wellbeing Among Older Americans.” *Ageing & Society* 39:568-589.

Tay, Louis, Vincent Ng, Lauren Kuykendall, and Ed Diener. 2014. “Demographic Factors and Worker Well-Being: An Empirical Review Using Representative Data from the United States and Across the World.” Pp. 235-283 in *The Role of Demographics in Occupational Stress and Well-Being*, Vol. 12, edited by P. L. Perrewé, C. C. Rosen, and J. R. B. Halbesleben. Bingley, United Kingdom: Emerald Publishing Limited.

Taylor, Dorceta E. 2014. *The State of Diversity in Environmental Organizations*. Washington, DC: Green 2.0. Retrieved July 30, 2022 (https://diversegreen.org/wp-content/uploads/2021/01/FullReport_Green2.0_FINAL.pdf).

Taylor, Dorceta E. 2018. “Racial and Ethnic Differences in Connectedness to Nature and Landscape Preferences Among College Students.” *Environmental Justice* 11(3):118-136.

Wadsworth, Tim. 2016. “Marriage and Subjective Well-Being: How and Why Context Matters.” *Social Indicators Research* 126: 1025-1048.

Welsch, Heinz. 2002. “Preferences over Prosperity and Pollution: Environmental Valuation Based on Happiness Surveys.” *Kyklos* 55(4):473-494.

Wilson, Edward O. 1984. *Biophilia*. Cambridge, MA: Harvard University Press.

Yang, Yang. 2008. “Social Inequalities in Happiness in the United States, 1972-2004: An Age-Period-Cohort Analysis.” *American Sociological Review* 73(2): 204-226.

Yoo, Hyung Chol, Adam Y. Kim, and Richard M. Lee. 2018. “Race and Subjective Well-Being: Critical Race Perspective and Empirical Review of Key Predictors.” In *Handbook of Well-Being*, edited by E. Diener, S. Oishi, and L. Tay. Salt Lake City, UT: DEF Publishers.

United Nations Development Programme. 2022. “Sustainable Development Goals.” Retrieved July 18, 2022. (https://www.undp.org/sustainable-development-goals).

U.S. Census Bureau 2021. *Population Estimates, July 2021*. Washington, DC: U.S. Census Bureau. Retrieved July 20, 2022 (https://www.census.gov/quickfacts/fact/table/US/PST045221).

U.S. Environmental Protection Agency. 2009. *Buildings and Their Impact on the Environment: A Statistical Report.* Retrieved July 20, 2022 (https://archive.epa.gov/greenbuilding/web/pdf/gbstats.pdf).

Chapter 5:

Conclusion

The promise of SWB as a useful metric of human well-being has inspired researchers and policymakers across the world. The fact that over 40 countries now measure SWB demonstrates that SWB has wide acceptance in policy circles (Diener, Oishi, and Lucas 2015). While the current literature provides valuable insight into what influences SWB, many notable gaps remain. In this dissertation, I focused on two of these gaps: the lack of sociological perspectives in SWB research, and the need to consider the influence of experiences in nature and the condition of the biophysical environment on SWB. My work was driven by three core research questions, which were "How does one's life experiences and position in the social structure influence one's SWB?", "How do experiences with the biophysical environment influence individual SWB?", and "Is SWB a potentially useful indicator of sustainable development?".

I argued that sociological theory and methods are well-suited to examine how objective circumstances influence subjective experiences and perceptions of reality, such as SWB. One of my intentions through this work was to advocate for a sociology of SWB in which more sociologists engage in SWB research and that conversations regarding SWB emerge in sociological publications. In 2014, Orlando Patterson argued in *The Chronicle of Higher Education* that sociologists had made themselves "irrelevant" by struggling to engage in contemporary policy debates. He stated, "sociologists have become distant spectators rather than shapers of policy. In the effort to keep ourselves academically pure, we've also become largely irrelevant in molding the most important social enterprises of our era" (Patterson 2014). While he was specifically discussing the lack of sociological input into polices regarding racial and economic inequality in the U.S., this sentiment can be extended to the realm of SWB, which is

being seriously discussed in policy arenas, yet few sociologists are participating in this dialogue. Engaging in SWB research is an opportunity for our discipline to conduct meaningful work truly relevant to peoples' well-being and which has the attention of national governments and international bodies, including the UN.

The three studies I conducted in this dissertation present not only findings of interest for sociologists, but also several engaging avenues for further research. It is my hope that, especially as I pursue publication of these studies in peer-reviewed journals, sociologists take note and explore some of these avenues themselves. Some particularly promising paths include racial and ethnic inequalities in SWB, particularly by adopting an intersectional approach, as well as examining the relationships between financial satisfaction, wealth, wealth inequality, and SWB, which emerged as interesting themes in chapters 2 and 3.

SWB also has important implications for the environmental social sciences and sustainable development. To pursue the goals of mutual human and non-human flourishing, we need indicators which can bridge the gap between humans and the natural environment (Dietz 2015). In the third and fourth chapters of this dissertation, I demonstrated that standardized measures of SWB reflect both experiences in nature and the conditions of the biophysical environment. These findings strengthen the case for SWB as an indicator of human well-being. This is especially important considering that measures such as GDP and household income, which have been relied on for decades as proxy measures of SWB, have been criticized for not being receptive to issues such as environmental degradation (Dietz 2015; Dasgupta 2001). As I argued in the previous chapter, SWB could be used as one a few measures to assess progress in achieving the sustainable development goals adopted by the UN general assembly (United National Development Programme 2022).

Another theme which emerged across the three studies was the need for longitudinal research which can better establish exactly what is a cause of higher or lower SWB and what is a symptom of SWB, as well as how other variables and SWB reinforce one another. As I explored some relatively new questions regarding SWB in this dissertation, my cross-sectional approach seemed appropriate, but I acknowledge that I can only theorize that the social and environmental variables in the studies influenced SWB, as more evidence is needed to establish clear causal paths.

In closing, I would like to mention a few areas of future research I would like to pursue which I did not discuss in detail in any of the previous chapters. First, while working on Chapter 3, I became fascinated with the topic of how wealth inequality was related to SWB. This includes comparing the effects of wealth verses income on SWB, as well as whether wealth inequality is generally positively associated with SWB, as was found to be the case in that study, or negative. I would like to further delve into this topic by conducting a cross-national longitudinal analysis to examine the questions just mentioned.

Second, an area I thought about a lot while working on this dissertation, but which I ultimately decided to save for a later time, is the relationship between experiences with non-human animals and SWB. This is an area that has received almost no attention, yet I see it as a natural extension of this dissertation. I am particularly fascinated by this due to my long-standing interest in our interactions with other animals and I have fostered this interest through my participation in Michigan State's Animal Studies Graduate Specialization. I am inspired in part by the "One Health" initiative, which emphasizes the interconnectedness between human, non-human, and environmental well-being (Gibbs 2014). As part of the Qualtrics survey I conducted for the previous chapter, I asked respondents about their connection to non-human animals,

whether they live with companion animals, and their beliefs and behaviors in regard to their companion animals. I hope to use this data as a starting point for this research.

Finally, I have would like to further examine how pro-environmental behaviors such as recycling and limiting energy use contribute to SWB, as well as the relationship between SWB and beliefs about climate change. For this research I would also draw upon data from the Qualtrics survey, which asked respondents about these topics. This would extend the breadth of the work I began in this dissertation, as well build upon existing research which has found a positive relationship between engagement in pro-environmental behaviors and SWB (Schmitt et al. 2018; Venhoeven, Bolderdijk, and Steg 2013).

In closing, I hope that not only has this dissertation improved our understanding of SWB and its potential usefulness for policy, but also inspired hope for and action towards a brighter, more sustainable future for all beings who share this earth

REFERENCES

REFERENCES

Dasgupta, Partha. 2001. *Human Well-Being and the Natural Environment*. New York: Oxford University Press.

Diener, Ed., Shigehiro Oishi, Richard E. Lucas. 2015. "National Accounts of Subjective Well-Being." *American Psychologist* 70(3):234-242.

Dietz, Thomas. 2015. "Prolegomenon to a Structural Human Ecology of Human Well-Being." *Sociology of Development* 1(1):123-148.

Gibbs, E. Paul J. 2014. "The Evolution of One Health: A Decade of Progress and Challenges for the Future." *Veterinary Record* 174(4):85-91

Patterson, Orlando. 2014. "How Sociologists Made Themselves Irrelevant." *The Chronicle of Higher Education*, December 1. Retrieved July 30, 2022 (https://www.chronicle.com/article/how-sociologists-made-themselves-irrelevant/?cid=gen_sign_in).

Schmitt, Michael T., Lara B. Aknin, Jonn Axsen, and Rachael L. Shwom. 2018. "Unpacking the Relationships Between Pro-Environmental Behaviour, Life Satisfaction, and Perceived Ecological Threat." *Ecological Economics* 143:130-140.

United Nations Development Programme. 2022. "Sustainable Development Goals." Retrieved July 18, 2022. (https://www.undp.org/sustainable-development-goals).

Venhoeven, Leonie A., Jan Willem Bolderdijk, and Linda Steg. 2013. "Explaining the Paradox: How Pro-Environmental Behaviour Can Both Thwart and Foster Well-Being." *Sustainability* 5:1372-1386.