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Personality Traits Associated with Environmental Concern

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Walden University

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Tara Wuertz

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Walden University

2015

Abstract

Personality Traits Associated With Environmental Concern

by

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MA, California State University San Bernardino, 2006

BS, University of Kansas, 1994

Dissertation Submitted

of the Requirements for the Degree of

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Abstract

The 5 factor model of personality, including the traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism, is a well-established theoretical model for describing how personality is structured. Hirsh (2010) demonstrated the big 5 personality traits, excluding extraversion, were correlated with pro-environmental attitudes. The purpose of this quantitative study was to replicate previous findings, and discover if there was a correlation with a person's pro-environmental behaviors and the big 5 personality traits. A total of 100 participants from an online participant pool completed a survey, which included the Environmental Concern Scale to measure concern and attitudes about the environment, and the General Ecological Behavior scale and the Self-Reported Pro-environmental Behavior Scale to measure participants' pro-environmental behaviors. Bivariate correlations and multiple regression were performed to determine the predictive relationship between personality traits and pro-environmental attitudes and behaviors. The trait of openness was significantly correlated with both pro-environmental attitudes, $r(91) = .36, p < .01$, and behaviors $r(93) = .41, p < .01$. Agreeableness was also significantly correlated with pro-environmental behaviors $r(93) = .26, p < .05$. Multiple regression revealed that trait of openness was found to be a significant predictor of pro-environmental concern $F(5, 87) = 3.69, p < .005$, and behaviors $F(5, 89) = 4.04, p < .002$. The implications for positive social change include a better understanding for psychologists of which of the Big 5 personality traits are more likely to contribute in the participation preserving the environment.

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Chapter 1: Introduction to the Study

Background

There is increasing awareness of the subject of environmentalism around the world. In the United States, public awareness of climate change has increased in the last decade (Kim, 2010). Almost 97% of people are aware of global warming and environmental problems (Li, Johnson, & Zaval, 2011). According to Gifford (2008), climate change is affecting many people and places with global warming, pollution, and severe weather patterns; this trend will continue unless changes are made to protect the environment.

Climate change, severe weather patterns, air pollution, and other environmental issues are not only harming the environment, but may have a negative influence on people around the world. Global climate change is predicted to have negative effects on the well-being and mental health of individuals (Doherty & Clayton, 2011). With a growing knowledge of the threat to climate change, some people may experience emotional stress and anxiety (Nurse, Basher, Bone, & Bird, 2010). As temperatures rise, so may the likelihood of extreme weather events (McMichael & Lindgren 2011). As hurricanes, floods, heat waves, and droughts occur, people may be displaced from their homes. Natural disasters may lead to posttraumatic stress disorder, sleeping issues, depression, drug and alcohol abuse, higher rates of suicide, and a higher risk of child abuse (Fritze, Blahki, Burke, & Wiseman, 2008). The negative emotional effects that natural disasters have caused can already be observed. Typhoon Haiyan has displaced over 12,000 people from their homes and killed over 5,200 people (Chen, Arredy, & Hookway, 2013). Families have to face the emotional stress of losing family members as

well as their homes. As the global temperature rise, these types of natural disasters are also expected to increase.

Ameliorating the negative effects on the environment of global warming, pollution, and changing weather patterns, will require people to change many behaviors they perform routinely. Although many steps have been taken to alleviate environmental problems, such as establishing the Environmental Protection Agency and ad campaigns that focus on recycling, human behavior is not changing fast enough to stop the increasing greenhouse gases and other environmental damage (Gifford, 2011). People understand that there is a problem with global warming and keeping a sustainable environment, but have done little to change their environmentally-damaging behavior (Gifford, 2011). For example, most people know that plastic shopping bags take years to decompose in landfills, use energy to produce, and often kill ocean animals which mistake them for food, but they do not take reusable bags when shopping.

Sustainable behaviors are behaviors that aim to meet the needs of the present generation without hurting the ability of future generations to meet their needs of clean water and air, and resources needed to survive (United Nations Commission on Sustainable Behaviors, 2007). Sustainable behaviors can consist of recycling, reducing energy consumption, using nontoxic products, and buying organic produce. The results of not using sustainable behaviors can already be seen. For example, the Cape Cod area overfished cod and almost completely depleted the supply of Cod. Currently, Cape Cod must import most of their cod from Iceland (Gotbaum, 2014). Even though many people are aware of environmental issues, and behavior that should be changed to limit damage to the environment, some people are not changing their behavior. The trends of current

behaviors will not leave the environment suitable for future generations (Oskamp, 2000). To be able to solve large-scale environmental issues, people must change their behavior to promote protection of the environment and sustainability (Zeleny & Shultz, 2000). People must develop behaviors that promote a proenvironmental, sustainable environment (Kazdin, 2009).

People who have a positive attitude about the environment are more likely to exhibit proenvironmental behaviors. Proenvironmental attitudes often lead an individual to act with proenvironmental behavior (Jimenez-Sanchez & Lafuente, 2008). Proenvironmental attitudes are the positive beliefs and values that a person possesses about the environment (Jimenez-Sanchez & Lafuente, 2008). People who are connected to the environment will likely increase performing proenvironmental behavior.

Personality has been used in the psychological sciences to identify many types of traits that people exhibit that influence behavior. A model that is used to examine personality trait differences is the big five taxonomy of personality (John, Angleitner, & Ostendorf, 1988). The big five model has been used to define the personality traits by scales of openness, conscientiousness, extraversion, agreeableness, and neuroticism (Anusic, Schimmack, Lockwood, & Pinkus, 2009). These traits are derived from the study of how people describe themselves and each other in the use of natural language (McCrea & John, 1992).

The big five model of personality traits have shown to be reliable in predicting many areas of a person's life. For example, positive and negative affect, life and marital satisfaction, career achievement, and life span (Over & Benet-Martinez, 2006) are correlated with big five traits. Less evidence is available on how the five traits manifest

themselves in behavior (Fleeson & Gallagher, 2009). Hirsh (2010) linked the traits of agreeableness and conscientiousness to environmental concern. The purpose of this study was to determine if there was a correlation between the big five personality traits and proenvironmental behavior. Once psychologists have a better understanding of how traits manifest themselves in proenvironmental behavior, then increasing certain behaviors may also be better understood.

This chapter begins with the purpose of the study and why the study is important. Next, I provide an explanation of the big five, which was the theoretical framework for this study. In the problem statement and nature of the study, I will specify what I examined and how the study was conducted. The research questions and hypotheses that were tested are listed, as well as operational definitions. The assumptions and limitations for this study are reviewed. Last, the significance and social change implications are described.

Purpose of the Study

Environmental concern has been increasing around the world. Many people believe in global warming, and worry about environmental problems (Li et al., 2011); however, many people still engage in behaviors that are destructive to the environment (Gifford, 2011). Psychologists have designed interventions that support behavioral changes that will decrease climate change (Swim et al., 2011). Better understanding of personality traits that correlate with proenvironmental attitudes and behaviors can help psychologists understand how to design messages and behavioral models to facilitate people making better decisions to preserve the environment.

Extraverted individuals often actively seek pleasurable and new experiences (Roccas, Sagiv, Schwartz, & Knafo, 2002). Messages about environmental tourism to exotic places may be more appealing to an extraverted person. These environmental messages could raise awareness on how an individual may vacation in a more proenvironmental manner. Conscientiousness has been associated with better health behaviors such as driving within the speed limit, more exercise, and having a better diet (Nisbet & Gick, 2008). It may be that a person who is more conscientiousness may be more motivated to live an environmentally friendly lifestyle because better air quality is tied to health concerns. Environmental messages could be designed to increase health concerns of the conscientious which in turn increases proenvironmental behavior.

The purpose of this quantitative study was to discern if big five personality traits (predictor variables) were correlated with proenvironmental attitudes or proenvironmental behaviors (criterion variables). Previous researchers have found that there is a relationship between proenvironmental attitudes and the personality traits of openness, agreeableness, conscientiousness, and neuroticism (Hirsh, 2010). I aimed to replicate these findings. I also wished to discover if attitudes were correlated with proenvironmental behaviors and the big five personality traits.

Theoretical Framework

The big five personality model has been used to understand and organize the main trait descriptors of personality (Kotov, Gamez, Schmidt, & Watson, 2010). In the 1930s, Allport (as cited in Hall & Gardner, 1959) claimed that traits were how personality was represented; Allport claimed that behavior is also motivated by traits. In 1936, Allport and Odbert (as cited in John, 2008) conducted a study of personality terms that were in

the English dictionary. Allport and Odbert were able to find 18,000 terms that described personality; Allport and Odbert categorized the terms into four major categories (as cited in John, Naumann, & Soto, 2008). In 1943, Catell organized Allport's and Odbert's 18,000 terms and derived a theory of 16 personality traits (Zuckermann, 2011). In the 1960s, many other psychologists became interested in identifying the main personality traits that could describe the domain of personality. Research was conducted independently and agreement was found about the number of main traits and what comprised these traits (Digman, 2002). The big five traits still prevail as one of the most used description of personality traits.

The big five has grown as one of the accepted models of describing personality. The big five is the most widely used model of individual personality trait differences (Anusic et al., 2009). The five accepted traits by psychologists are extraversion, agreeableness, neuroticism, conscientiousness, and openness.

Researchers have been able to link job selection to personality traits (Shane, Cherkas, Spector, & Nicolaou, 2010). Entrepreneurs have been found to be more extraverted and open (Shane et al., 2010). Openness has been found to be a predictor of citizenship in the workplace (Chiaburu, Berry, Li, Gardner, & Oh, 2011). Employees who exhibit openness tend to be more creative and independent employees. A lack of openness and low levels of agreeableness are reliable predictors of conservative political orientation (Roth & Collani, 2007). Conservative political affiliation has been associated with low proenvironmental concern and proenvironmental behavior (Roth & Collani, 2007). Because political affiliation is correlated with lower levels of environmentalism, this population could be targeted with different proenvironmental messages that focus on

saving money, or health concerns, but would actually be focused on increasing proenvironmental behaviors. While researchers have not explored if proenvironmental behaviors are correlated with the big five traits, the big five traits have been found to be correlated with many other areas in research.

Problem Statement

Although researchers have investigated how the big five is related to workplace behavior (Chiaburu et al., 2011), political affiliation (Roth & Collani, 2007), and dream recall (Aumann, Lahl, & Pietrowsky, 2012), there is a lack of research on environmentally-sustainable behavior and how these behaviors relate to the big five personality traits (Griskevicius, Van Den Bergh, & Tybur, 2010). Hirsh (2010) found that there is a positive correlation between environmental concern and the personality traits of agreeableness and openness. Hirsh also found the traits of neuroticism and conscientiousness to be correlated, but not as strongly. In this study, I determined if concern and attitudes were also related to performing proenvironmental behaviors. The purpose of this study was to explore if there was a positive relationship between one or more personality traits of the big five and proenvironmental attitudes and behaviors.

Nature of Study

This was a quantitative cross-sectional correlational study. Multiple regression was used in analysis to determine which big five personality traits (independent variables, [IVs]) were correlated with proenvironmental attitudes and proenvironmental behavior (dependent variables, [DVs]). Proenvironmental attitudes are the positive beliefs that people have about the environment (Jimenez-Sanchez & Lafuente, 2010).

Proenvironmental behaviors are behaviors that are beneficial for the environment and can include recycling, water conservation, or using public transportation.

Multiple regression is often used in research that is exploratory in nature and can be used to determine which IV has the largest influence over the criterion variable (Mertler & Vanatta, 2010). The big five Inventory (BFI); (John & Srivastava, 1999) was used to assess the IV of the big five personality traits. The Self-Reported Proenvironmental Scale (Shultz & Zelenzny, 1998), the Environmental Concern Scale (Weigel & Weigel, 1978), and the General Ecological Behavior scale (Kaiser, 1998) were used to measure the DVs. The Environmental Concern Scale measures concern for the environment. The General Ecological Behavior Scale and the Self-Reported Proenvironmental Scale measure environmental behaviors. The sample size needed for this study was 100 participants.

Research Questions and Hypotheses

1. Are the big-5 personality traits correlated with proenvironmental attitude and behaviors?

Hypotheses for Research Question 1 (Appendix A).

2. In multiple regression, which big five personality traits are associated with proenvironmental attitudes and/or behavior?

Hypotheses for Research Question 2 (Appendix B).

Definitions

Big five model: A method for describing human personality trait structure (Roccas et al., 2002). The five traits were determined after years of analysis of natural language terms that people use to describe their own and other's personality. Openness,

conscientiousness, agreeableness, extraversion, and neuroticism are the five traits that have been found to be reproducible in factor analysis of trait descriptors in the English language. The traits display consistent patterns in thoughts, feelings, and behaviors that are consistent across time and situations (Rocass et al. 2002).

Proenvironmental behaviors: Behaviors that are aimed at reducing climate change or consequences of climate change (Gifford, 2008).

Proenvironmental concern: Values, attitudes, and beliefs that a person has that leads them to be ecologically conscientious (Jimenez-Sanchez, & Lafuente, 2008). There is also a belief that all people have a relationship with the environment (Jimenez-Sanchez & Lafuente, 2008). Often these attitudes will lead to behaviors or actions to protect the environment. The terms concern and attitude may be used interchangeably.

Assumptions of Study

1. I assumed that the participants would answer the questions on the measures honestly. Some of the questions on the measures may not have had traits or behaviors that are socially desirable, and people may not want to admit they have these traits or behaviors.
2. I assumed that there was a linear relationship between personality traits and proenvironmental attitudes and behaviors and multiple regression was the correct model.
3. I assumed the sample characteristics were appropriate for the study.
4. I assumed that I followed the scoring requirements for the Big Five Inventory, the Environmental Concern Scale, the Self-Reported

Environmental Behavior Scale, and the General Environmental Behavior Scale, and I did not skew the results.

Limitations

This study was exploratory in nature and provided an initial line of research on personality and proenvironmental concerns and behavior. Further studies will need to be conducted to establish generalizability for populations beyond the study. The sample in this study was a convenience sample limited to 100 participants from the Walden Participant Pool. Results from this study should be viewed as the initial step for further analysis of personality traits and proenvironmental attitudes and behaviors.

Significance of Study

In this study, I determined if personality traits were related to proenvironmental behaviors. Understanding if there is a correlation between one or more of the big five personality traits will increase the knowledge of which personality traits can be used to predict proenvironmental attitudes and/or behaviors. Scientists using the big five model have not been able to determine how the traits lead to proenvironmental behaviors (Fleeson & Gallagher, 2009). This study may provide initial information about the link between the big five traits and proenvironmental behavior. Development and implementation of environmentally-responsible behaviors is a challenge for the behavioral sciences (Kaplan, 2000). In this study, I provided insight on which big five personality traits were more likely to lead to proenvironmental behaviors. Psychologists could then look at which facet of the trait leads to proenvironmental behavior.

Social Change Implications

Global warming and other environmental issues have been created by people. Numerous environmental problems are a result of human actions which necessitate behavioral changes for solutions (Hirsh, 2010). Social scientists, and governmental, and nongovernmental agencies struggle with increasing people's engagement in environmental issues and promoting proenvironmental behaviors (Scannel & Gifford, 2011). Lingwood (as cited in Borden & Shettino, 1979) found that environmental concern was much more important than environmental knowledge when it came to proenvironmental behaviors. Scientists have known for many years that environmental knowledge alone is not enough to motivate people to change their maladaptive environmental behaviors. Understanding the personality traits that are correlated with proenvironmental behaviors may lead to insight on preserving the environment.

Psychologists have played a role in describing the consequences of environmental damage and how to motivate people to change behavior to lead to the conservation of the environment (Gifford, 2008). Researchers have proven that the big five personality traits are effective in providing information and predicting positive and negative affect, life and marital satisfaction, career achievement, and even life span (Ozer & Benet-Martinez, 2006). What is not understood is how traits present themselves in proenvironmental behavior (Fleeson & Gallager, 2009). When psychologists better understand how traits are related to behavior, focus can then be put on changing behavior for the good of the environment.

Learning styles have also been linked to big five traits (Major, Turner, & Fletcher, 2006). A better understanding of which people with certain personality traits are already

living a proenvironmental lifestyle can lead psychologists to design interventions to increase actions of environmental conservation and further the understanding of why people respond or do not respond to certain messages based upon personality traits to increase proenvironmental behaviors.

Summary

The big five personality traits have become an accepted model for describing personality (Ekehammar et al., 2010). These traits represent persistent dispositions and behavior of people (Roccas et al., 2002). Researchers have used the big five traits to predict job satisfaction, school success, and mental health. It is not understood how these traits are related to proenvironmental attitudes and behaviors. Psychologists can make contributions to understanding what influences behavioral responses to ease the impact of environmental problems. The big five will be reviewed in greater detail in Chapter 2. Specific proenvironmental behaviors, along with the implication of these behaviors, will also be an aspect of Chapter 2. In Chapter 3, the study design will be reviewed. The statistical procedures will also be examined in Chapter 3. Chapter 4 is a report of the results and Chapter 5 is the interpretation and discussion of those results.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative study was to determine if the big five personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism influenced proenvironmental attitudes or behaviors. If there is a correlation between personality traits and proenvironmental attitudes and behaviors, it is important to determine which trait has the most influence.

To find sources for this literature review, I searched peer-reviewed articles from online databases and resources. The databases included PsychArticles, Sage Full-Text collection, ProQuest, Academic Search Complete/Premier, Psych Info, EBSCO, Google Scholar, and Questia. The main keywords used for searching for sources were *big five*, *environmental conservation*, *personality*, *personality traits*, *sustainability*, *proenvironmental behavior*, *environmental education*, *environmental sustainable education*, *environmental attitudes*, and *climate change*. The retrieval services were provided through Walden University and some public websites. If an article was not available it was ordered through Walden's document delivery service. Some book chapters were used in providing the history of the development of the big five theory. The book chapters were retrieved through Walden's PsycBooks link. The documents used were either peer-reviewed articles or information provided by local, state, and the U.S. Government.

This chapter begins with the history and development of the big five model of personality. Next, the traits that comprise the big five are described. A description of

some proenvironmental behaviors is provided. Other personality theories and how they relate to proenvironmental attitudes and behaviors are reviewed in this chapter.

History of the Big Five

The big five has emerged as a robust model of personality. A trait is a stable and salient personality characteristic in which a person will display certain behaviors in a situation (Anusic et al., 2009). The five factor model of personality is used to describe personality and traits (Ekehammar et al., 2010). Allport was one of the first to recognize and influence research in personality traits. Allport believed that, even though a person's behavior can be variable, there is a portion of behavior that remains constant and consistent in each person (as cited in Friedman & Schustack, 2009). Allport was also instrumental in influencing the idea that personality traits are biological (Zuckerman, 2011). Allport also believed that personality is represented through traits and those traits drive behavior (as cited in Hall & Gardner, 1959). While Allport believed that many individuals will share the same traits, they will be unique in the way that the trait functions for each person (as cited in Hall & Gardner, 1959). While a person's behavior may change according to different situations, the underlying traits they possess will lead them to act in a certain way.

The big five model is derived from the study of the words used in everyday language. Starting in 1936, Allport and Odbert conducted a lexical study of all the personality relevant terms that appeared in an unabridged English dictionary (as cited in John et al., 2008). Allport and Odbert recognized that, with the abundance of terms that describe personality, there must be social importance in studying the traits (as cited in McCrae & John, 1992). In the dictionary, Allport and Odbert found close to 18,000 terms

describing personality that could be broken into four major categories (as cited in John et al., 2008). The categories were named cardinal, central, secondary and expressive traits (Allport & Odbert as cited in Hall & Gardner, 1959). The central traits are the traits that people are often described as by others. These central traits became the traits that are now used in the big five model of personality.

Allport and Odbert created a model base of personality for other researchers. Cattell (1943) chose to use Allport and Odbert's list as a starting point with a subset of 4,500 traits that could be reduced down to 35 personality trait variables. Cattell was able to later narrow these down to 16 personality factors (as cited in John & Srivastava, 1999). After more analysis, Cattell narrowed the main traits to three, which resemble what are now referred to as extraversion, openness, and conscientiousness (as cited in Zuckerman, 2011). Due to data limitations, conducting factor analysis was costly and too complex, which left some of Cattell's work to be questioned, and the statistical findings remain controversial (John et al., 2008). In 1969, Eysenck, White, and Soueif tried to reproduce Cattell's findings of the 16 factors, but were unsuccessful, as were other researchers who tried at this time (Zuckerman, 2011). Eysenck noticed that extraversion and neuroticism were often components being identified in many psychological tests (McCrae & John, 1992). While Cattell's finding could not be reproduced, Cattell paved the way for further study on personality.

Many other researchers began their own independent studies of personality traits. Fiske (1949), Tupes and Christal (1961), Norman (1963), Borgatta (1964), and Norman and Goldberg (1966) all found agreement in the number of personality traits and what described the traits. McCrae and Costa (1989) demonstrated a union for the five factors

when peer ratings and personal questionnaires were used. Similar findings to Costa and McCrae are available from Goldberg, Ostendorf, and Trapnell, and Wiggins (as cited in Zuckerman, 2011). In 1980, Costa and McCrae developed an assessment to measure openness and it became an accepted trait (McCrae & John, 1992). In 1985 and 1989, scales to measure agreeableness and conscientiousness were also created by Costa and McCrae (as cited by McCrae & John, 1991). Each of the five traits are divided into six facets that the traits present and are currently used in measurement (Zuckerman, 2011). Much of the work by Costa and McCrae was completed to establish the consistency of the traits and build upon the foundation of other researchers before them (as cited by Zuckerman, 2011). Most trait theorists agree on the basic traits, but disagreement still occurs upon the facets that comprise the traits (Zuckerman, 2011).

Many researchers believe that traits are biologically inherited. Costa and McCrae, (1989), building upon Allport's theory, argued that personality traits are biologically influenced by genetics and are relatively stable after 30 years of age. For example, evidence for extraversion has been linked to dopamine receptors which influence seeking new and novel experiences (Zuckerman, 2011). The right anterior hippocampus is larger in people who seek new experiences (Wiskott, Rasch, & Kemperman, 2006). This could be influenced either by genetically triggered growth in that area or caused by greater exposure to novel experiences which stimulated growth (Wiskott et al., 2006).

Ivashchenko, Berus, Zhuravlev, and Myamlin (1999) found correlations between EEG beta activity in the frontal and temporal lobe sites during negative emotions which may be a sign of neuroticism. Discoveries of the connections between biology and traits are still being researched.

The Big Five

While there is still debate in the psychological community, five traits have been accepted as a personality model. Most theorists do agree on three or four of the basic traits; but, disagreement still lies in what facets the traits are comprised (Zuckerman, 2011). There has been criticism of the naming of the trait of neuroticism due to a negative connotation of the name (Roccas et al., 2002). The five traits are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. McCrae and Costa (1990) defined traits as “dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions” (p. 23). Traits are consistent over time and situations. Traits are also predictors of individual and social outcomes (Yang et al., 2014). Traits have become a method of describing behaviors and characteristics of people in everyday language. Based on behaviors exhibited in the past by a person, future behaviors of the same person may be predicted.

People who rate high in openness are inclined to be creative, intellectual, sensitive, and open-minded (Roccas et al., 2002). Open people tend to have broad cultural interests and enjoy novel experiences (Caprara, Barbaranelli, Consiglio, Picconi, & Zimbardo, 2003). Openness portrays a person’s level of imagination, and openness to new ideas and experiences (Hirsh & Dolderman, 2007). Intellect and artistic interests are important aspects to openness, thus open people like puzzles, brain teasers, and toying with ideas (Johnson, n.d.). Intellect is a style of the trait, but does not reflect overall intelligence. This means that a person who is more open may prefer trying challenging brain puzzles.

Those who score high in conscientiousness are apt to be careful, responsible, meticulous, and trustworthy (Roccas et al., 2002). They also tend to be organized, purposeful, and ambitious (Major, Turner, & Fletcher, 2006). Conscientious people tend to have high impulse control, which facilitates task setting and goal reaching (Gerber et al., 2011). They will think before acting, can delay gratification, and more likely to following norms (Gerber et al., 2011). People who score high in conscientiousness rate high in self-efficacy (Johnson, n.d.). Those who score low in conscientiousness tend to be indolent, careless, lax, and more hedonistic (Costa & Widiger, 1994).

People that score high in extraversion are likely to be sociable, talkative, confident, and energetic (Srivatava, 2013). They like to present themselves in a positive light, have a higher level of activity, and like competition (Caprara et al., 2003). Extraversion is associated with an energetic approach to the world (John et al., 2008). On the opposite end of the scale are introverts. Introverts are not necessarily unfriendly or antisocial; rather, they tend to be more reserved and independent (Costa & Widiger, 1994).

Agreeable individuals tend to be modest, trusting, easy-going, and compassionate (Fazeli, 2012). People who score high in agreeableness tend to be more caring, empathetic, modest, and gentle (Fazeli, 2012). Agreeableness is associated with altruism, and prosocial behavior (Gerber et al., 2011). Those low in this trait may be rude, cynical, uncooperative, and vengeful (Costa & Widiger, 1994).

Those who score high in the category of neuroticism are more likely to be depressed, anxious, apprehensive, and angry (Major et al., 2006). Neuroticism is connected to low control of affect and emotional reactions (Caprara et al., 2003). People

who rate high in neuroticism may react strongly to an event that would not likely affect other individuals (Johnson, n.d.). They may also see everyday events as threatening, and ordinary problems become hopeless (Johnson, n.d.).

Scores on many different big five trait inventories, including the BFI, are highly reliable, valid, and predict a range of behaviors over time (Gerber et al., 2011). These trait dimensions have been successful in predicting attitudes and values (Hirsh, 2010). The big five has been successful at predicting positive and negative emotion, life satisfaction, marital satisfaction, work success, job satisfaction, juvenile delinquency, and school performance across a person's life span (Gerber et al., 2011; Fleeson & Gallager, 2009). These traits encompass broad dispositions that influence how people respond to the stimuli they face (Gerber et al., 2011). In a study about aging, Costa and McCrae (1989) found that a person's psychological well-being may be predicted years in advance based upon scores in neuroticism and extraversion. The inventories have also been used across many applied fields (Fazeli, 2012).

Hirsh (2010) found a correlation between the big five and environmental concern. Hirsh found agreeableness ($\beta = .22$) and openness ($\beta = .20$) to be significant predictors of pro-environmental concern. Hirsh also found the trait of neuroticism ($\beta = .16$) and conscientiousness ($\beta = .07$) to be correlated with environmental concern. Hirsh had 2,960 college students complete a 15 item adaptation of the BFI. Hirsh evaluated the participants on environmental concern by a measure created by the German Socio-Economic Panel Study. People who were rated high in agreeableness, and openness, tended to be more empathetic and have a personal connection with nature (Hirsh, 2010). Agreeableness is also connected with higher levels of empathy, which is thought to be

related to proenvironmental behaviors (Hirsh, 2010). Prosocial behavior and connectedness to nature will be discussed further later in this chapter.

Proenvironmental Behaviors

The most widely accepted definition of sustainability, used by governments around the world, was established by the World Commission on Environment and Development in 1987. According to the World Commission on Environment and Development (2007), sustainability “is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (para 2). There is a broad spectrum of behaviors that can be considered relevant to the environment such as energy conservation, pollution reduction, and recycling (Kaiser, Hartig, Brugger, & Duvier, 2011). One environmental behavior is recycling. On average, an American produces about 4.43 pounds of trash each day (Environmental Protection Agency [EPA], 2011). Only 1.51 pounds is recycled or composted (EPA, 2011). More than 50% of the trash is put into landfills (EPA, 2011). Only 8% of recyclable plastics are recycled (EPA, 2012). Increasing the amount of recycling would reduce the energy it takes to make new products, while decreasing the need for landfills.

Another area of sustainable behavior is the use of sustainable products. Sustainable products are considered beneficial or non-harming to the environment (Luchs, Naylor, Irwin, & Raghunathan, 2010). McDonald, Oates, Thyne, Alevizou, and McMorloand (2009) found that consumption of these products are not consistent or follow a predictable path. Luchs et al. (2010) found that while 40% of consumers report they are willing to buy sustainable products, only 4% do consistently. The use of sustainable products would decrease the amount of toxins released into the environment.

Along with sustainable products, using energy-efficient products is a behavioral change that is proenvironmental. Energy efficiency should be a top priority, and people need to be aware that better use of energy is crucial for sustainability (Kazdin, 2009). Buying appliances that are labeled with the Energy Star, from the EPA, can reduce greenhouse gas emission by 130,000 pounds over the lifetime of the appliance (EPA, 2013). Changing to compact fluorescent light (CFL) bulbs is also another action that has impact on energy consumption. CFLs use close to 75% less energy than a regular light bulb, and last much longer (EPA, 2013). Reducing energy consumption is a way to decrease the use of natural resources along with reducing pollution released into the environment.

Water conservation is also needed for sustainability. The United States Geological Survey (USGS; 2013) estimated that 2.5 % of the water on earth is fresh water. Many places in the United States depend upon ground water to provide fresh water, and about a third of those levels considered are below normal (USGS, 2013). Glaciers hold around 75% of the world's freshwater (National Snow and Ice Data Center, [NSIDC], 2013). Beginning in the 20th century, glaciers have begun to retreat at unprecedented rates (NSIDC, 2013). The average U.S. household uses more than 300 gallons of water every day (EPA, 2013).

Conserving water would reduce overall energy consumption as well. Pumping and treating water uses 3% of the nation's energy (EPA, 2013). Most of this water is used by toilets and washing clothes (EPA, 2013). A simple act, like replacing shower heads to low flow, can save up to 230 gallons per week (San Diego Government, n.d.). Many people in the American South West have redone lawns to xeriscaping, which is using

plants that are drought resistant and indigenous to the area (Arizona Department of Water Resources, 2012). Conserving water with actions like turning the water off when brushing teeth, and watering the lawn in the coolest part of the day, could have an impact on water conservation, energy conservation, and reducing greenhouse gasses.

Other behaviors are seen as much more problematic or difficult to change. Many behaviors that have become permanent in a daily routine are more difficult to change, and need motivation for that change (Gifford, 2011). Car driving is an example of a behavior that has proven to be problematic in changing (Gifford, 2011). Many people do not have access to public transportation, like that provided in cities such as New York, Seattle, or Chicago. Next to producing electricity, transportation is the second greatest cause to greenhouse gases and air pollution (EPA, 2013). One person switching their commute to work, by taking public transportation, could lower a household's carbon emissions by 10% (American Public transportation Association, 2013). Increasing efficient public transportation in larger cities has been a difficult issue, and often has not been a viable option for many people.

Other Personality Theories and Proenvironmental Behavior

Prosocial Behavior

Self-efficacy drives an individual's belief that a behavior can be performed. The belief that a person has about their own capabilities to attack a problem, or guide their behavior is self-efficacy (Taberero & Hernandez, 2010). Prosocial behavior is a behavior that is performed for the welfare of others (Taberero & Hernandez, 2010). These behaviors can include sharing, caring for others, comforting, volunteering, donating, or helping (Caprara, Alessandri, & Eisenberg, 2012). Ramus and Killmer

(2007) maintained that proenvironmental behavior is a kind of prosocial behavior. Environmentally-sound decisions are considered as a functional behavior that is beneficial for all people (Ramus & Kilmer, 2007). In order to act with proenvironmental behaviors, a person must have focus beyond them self and be concerned about society (Kollmuss & Agyman, 2002). Looking beyond an individual's self and having concern about the environment, for the betterment of others, is an example of prosocial behavior.

When a person feels adept at a behavior, they may feel fulfilled because of their own competence and abilities, thus promoting the likelihood of that behavior continuing (Taberner & Hernandez, 2010). An effective strategy for reaching people from the prosocial angle would be to inform them of the harm to the planet and its inhabitants (Griskevicius et al., 2010). Combining the environmental harming information with information about how to solve pollution, and global warming issues, could inspire feelings of self-efficacy. People are more likely to intrinsically care about what is happening to the world around them. Prosocial behavior has been linked to the five factor trait of agreeableness. Highly agreeable people are more willing to forgo their own interest for the benefit of others (Cumberland-Li, Eisenberg, & Reiser, 2004).

Connectedness to Nature

Connectedness to nature has shown to increase proenvironmental behavior. Many cultures around the world use natural environments for recreation, entertainment, and a distraction from daily life (Brugger, Kaiser, & Roczen, 2011). There has been an increasing amount of people, in western industrialized countries, who view themselves as separate from nature (Vining, Merrick, & Price, 2008). People were once more physically and psychologically attached to nature than industrialized nations are today (Vining et al.,

2008). Connectedness to nature is a person's level of feeling emotionally connected to the natural world (Cervinka, Roderer, & Hefler, 2011). If a person is connected with nature they will participate in outside activities and value nature in many different ways (Brugger et al., 2011). Connecting nature to an individual's identity is more likely to increase motivation for preserving the environment (Clayton & Myers, 2009). One of the most important steps to improving the environmental issues is to develop the sense of connectedness to nature. Feeling of connectedness, to any object, often leads to protective feelings.

More pleasurable experiences and feelings towards nature are causes for environmental conservation (Hartig, Kaiser, & Bowler, 2001). Leopold (as cited in Mayer, Frantz, Bruelman-Senecal, & Dolliver, 2009) argued that in order for people to feel responsible for nature, they need to feel connected to nature as a member. Increasing people's interaction with nature is a way to promote a positive connection with the environment.

Greenspaces have been found to be areas for the psychological betterment of many people. Higher ratios of greenspaces are related to better physical health, and are also known for their restorative effects (Mitchell & Popham, 2007). Greenspace is any space that is reserved or protected against development (Mitchell & Popham, 2007). By 2030, more than 60% of the world's population is expected to live in an urban environment (Barnett, 2004). Protecting greenspace in cities and rural environments has the potential to increase the feeling of connectedness to nature (Schultz, Shriver, Tabanico, & Khazian, 2003).

Individuals who are connected to nature have been found to have better psychological well-being (Cervinka et al., 2011). People also link natural environments to places that lead to solitude experiences, foster inner peace, and self-discovery (Clayton & Meyers, 2009). Other benefits of nature include recovery from stress and attention fatigue, encouragement to exercise, enables social contact, and benefits development in children (Mayer et al., 2009). Nature also offers people a break from daily routines (Hartig et al., 2001). Nisbet, Zelenski, and Murphy (2009) found that connectedness to nature is correlated to the personality traits of agreeableness ($r = .24, p < .001$), conscientiousness ($r = .15, p < .05$), extraversion ($r = .15, p < .05$), and openness ($r = .38, p < .05$) when using the Nature Relatedness scale. Protecting greenspaces may provide people with the restorative benefits, relief from stress, and areas to exercise that nature provides.

Psychologists have proposed to increase a person's connectedness to nature is to focus on local and current issues to increase engagement in proenvironmental behaviors (Scannell & Gifford, 2011). An individual's perception about environmental issues may be different based upon where they live, and what they have personally experienced (Collins & Kearins, 2010). Behaving in an ecological way may result in concerns of habitat destruction, climate change, and others consequences of human behavior (Hartig et al., 2001). Being able to increase knowledge of local environmental issues may be one way of increasing connectedness to nature.

Norm Activation in Proenvironmental Behaviors

Social norms are an effective way of influencing people to act in a certain way. One way that marketers and public policy advocates encourage people to participate in

sustainable behaviors is to use social norms (White & Simpson, 2013). Studies have focused on social norms that increase recycling behavior, energy conservation, and decreasing littering (Jacobson, Cialdini, & Mortensen, 2010). People are motivated by social cues, and these cues are significant in motivating people to engage in sustainable behaviors (Griskevicius et al., 2010). Social norms influence an individual to act in a way that is socially acceptable.

Learning behaviors that are acceptable also leads to norm activation. Norm activation depends upon a person realizing that the behavior may be harmful to another, and taking responsibility for that behavior (Shultz et al., 2005). Goldstien, Cialdini, and Griskevicius (2008) found social norms were more effective than environmental messages when encouraging hotel guest to reuse towels. Social norms are a point of reference that people use to analyze other's behavior which influences the intent to emulate the behavior (Ramus & Kilmer, 2005). Messages such as, "The majority of hotel guests reuse their towels," were most successful to motivate guests to participate in the conservation program (Goldstien et al., 2008). Cialdini (2003) found the same type of message was most successful for getting hotel guests to reuse their towels. The message Cialdini (2003) found most successful was, "Join your fellow citizens in helping save the environment." These messages were clear in what the hotel wanted the guest to do, but used social norms to target behavior.

This technique of using descriptive norms for behavior was able to increase towel reuse which benefits the hotel as well as the environment. An aspect is what form of message will persuade which type of people to respond to what message. Since agreeableness is the trait that rates high in empathy, altruistic behavior norm activation

works well in increasing proenvironmental behaviors in those with an agreeable personality (Hirsh & Dolderman, 2007).

Summary

This chapter was an overview of the history and development of the big five model of personality. The big five traits were discussed in more detail, and what qualities a person would possess if they measured high in one of the traits. Some of the most common proenvironmental and sustainable behaviors were described to give examples of behaviors looked for in the study. Other popular psychological theories of prosocial behaviors, connectedness to nature, and norm activation that have been used to predict proenvironmental behaviors were discussed. These theories were also tied to traits that are in the big five.

Psychologists can, and have, played an important role in describing consequences of environmental damage, and how to motivate people to change behavior that leads to conservation of the environment (Gifford, 2008). Psychologists have designed interventions to increase actions of environmental conservation, and further the understanding of why people respond or do not respond to certain interventions (Swim et al., 2011). When motivation, behavior, and how people respond to information are better understood, interventions to change behavior for the betterment of the environment can be made. Strategies need to focus on both adaptation and modification to improve change (Kazdin, 2009).

The research design for this study is reviewed in Chapter 3. The sample selection along with sample size is also reviewed in the next chapter. Step-by-step research procedures will be provided. A description of the BFI and the three scales that assess

proenvironmental attitudes and behaviors are discussed. Lastly, the statistical procedures are provided for the data analysis that was performed.

Chapter 3: Research Method

Introduction

This chapter is a detailed explanation of the research design, sample, surveys used, data collection, and statistical analysis procedures. This was an exploratory study using a self-selected convenience sample from the Walden Participant Pool. A survey design was used to determine if the big five traits were significant to the percentage of variance in proenvironmental attitudes and behaviors (Cresswell, 2009).

Researchers have investigated how the big five personality traits are related to workplace behavior, political affiliation, life satisfaction, and dream recall. There has been a small amount of research on the big five traits being associated with environmentally sustainable attitudes. There is an absence of research in the big five traits being associated with proenvironmental attitudes and behaviors. The purpose of this study was to explore the relationships between openness, conscientiousness, extraversion, agreeableness, and neuroticism with environmental attitudes and behaviors as measured by the Self-Reported Proenvironmental Behavior Scale, the General Ecological Behavior Scale, and the Environmental Concern Scale.

The BFI was used to assess personality traits. Three instruments were used to measure general environmental concern and proenvironmental behavior. The first instrument reviewed is the Environmental Concern Scale, which measures general concern about environmental issues and which proenvironmental behaviors are performed. The General Ecological Scale measures an array of proenvironmental behaviors using 40 yes or no questions. The Self-Reported Proenvironmental Scale also

measures sustainable behaviors using 10 items ranking how often the behaviors are performed.

Research Design

A quantitative, cross-sectional, multiple regression research design was completed to determine if one or more of the Big Five personality traits correlated with proenvironmental concern or proenvironmental behaviors when measured by the Self-Reported Behavior Scale, the General Ecological Behavior Scale, and the Environmental Concern Scale. Quantitative data were gathered from the BFI and the three environmental surveys. There were not qualitative questions for participants to answer.

This study was exploratory in nature. Bivariate correlations and multiple regression were used to determine if there were correlations between personality traits and proenvironmental attitudes and proenvironmental behaviors. Multiple regression is often used when the researcher wants to discover if a specific independent variable affects a criterion variable (Mertler & Vanatta, 2010). Multiple regression has been proven to be an effective in the behavioral sciences when the criterion variable is being studied as a function of the independent variable (Cohen, 2003). In this study the independent variables were the five personality traits exhibited by each participant as determined by the BFI. The criterion variable signifies the percentage of variance in environmental concern and proenvironmental behavior of the participants as measured by the Environmental Concern Scale, the General Ecological Behavior scale, and the Self-Reported Proenvironmental scale.

The Walden Participant Pool was used as sample for this study. Due to the exploratory nature of this study, a convenience sample was used. If it turned out that were

any significant correlations between big five traits and proenvironmental attitudes or behaviors, future researchers should examine other samples of participants in more detail for generalizability. Extending the findings to other populations could have been a threat to external validity. External validity is when a researcher infers information from the data and tries to apply the information to other people, settings, or situations (Cresswell, 2009). The only resource constraint that was foreseeable was the availability participants in the pool.

This study presents few ethical considerations. All participants were adults and the topic did not require sensitive information to be provided. There were no qualifying criteria for the participants to meet to participate in the study. The sample was self-selecting. Biases may have been potentially present because those who chose to participate may have had more traits in common and be more interested in environmentalism than the general public.

Sample

The sample, in this study, was a convenience, nonprobability sample drawn from participants of the Walden Research Participant Pool. There were no specific eligibility requirements to participate in the study. Using a statistical calculator (<http://danielsoper.com/statcalc3/calc.aspx?id=1>) and the anticipated effect size of .15, the power level of .8, the numbers of predictors was five and the with the probability level of .05 the sample size needed to be 91 participants to complete the multiple regression analysis. A sample size of 100 participants was sought in the event that data could not be used because it was incomplete.

Research Procedures

After approval from the Walden Institutional Review Board (IRB) was secured, a notice was placed on the Walden Participant Pool website in the study sign up area. A brief description of the study was placed next to the eligibility requirements. The description stated: The Big Five personality traits have been used to predict a range of behaviors and attitudes such as, job or life satisfaction, and school success. I explored if there was a correlation between the big five personality traits and proenvironmental attitudes and behaviors.

1. I gained consent through a consent form which participants electronically signed for those participants who were willing to take part in the study (Appendix F).
2. A numerical code was assigned through the participant pool that was used for data collection and analysis. The code was used to maintain confidentiality and reduce researcher bias. All data were stored on an USB drive that was accessed only by me. The USB drive was kept in a locked file when not in use. All data will be erased after 5 years.
3. A brief demographic description was collected from participants online after gaining consent (Appendix E). The information was asked before the participants completed the survey. This included gender, age, and education level. This information was not used in data analysis, but to describe general information of the sample of participants in the study.
4. All participants were directed to complete the four measures online. The participants first completed the BFI (John & Srivastava, 1999; Appendix

A) which took approximately 15 minutes. Then the participants were asked to complete the Self-Reported Proenvironmental Behavior scale (Schultz & Zelenny, 1988; Appendix B), which took approximately 5 minutes. Next, the GEB (Kaiser 1989; Appendix C) was administered and required approximately 10 minutes. Last, the ECS (Weigal & Weigal, 1978; Appendix D) was answered taking approximately 10 minutes. All measures were easily completed in under an hour.

5. I reviewed the BFI, the Self-Reported Proenvironmental Scale, the GEB, and the ECS. If a participant did not complete all questionnaires then those measures were eliminated and not used in the study.
6. The BFI, the Self-Reported Proenvironmental Scale, the GEB, and ECS were scored separately.
7. Correlations and multiple regression analysis were completed to determine the percentage of variance of one or more big five personality traits were significant predictors of proenvironmental behaviors and/or concern as measured by the Self-Reported Proenvironmental Behavior Scale, the GEB, and ECS.

Instrumentation and Materials

The table below provides a visual of the instruments used in this study. The BFI was used to score the big five personality traits and determine if one or more traits were associated with proenvironmental attitudes or behaviors.

Table 1

Table of Measures in this Study

Measure	What is measured	Number of Items	Scoring	Reliability
Big Five Inventory	The traits of, Openness Conscientiousness Extraversion Agreeableness Neuroticism	44	Find the mean for the items in each personality domain	Openness .81 Conscientiousness. 82 Extraversion .88 Agreeableness .79 Neuroticism .84 Mean .83 using Cronbach's alpha
Environmental Concern Scale	Measures concern about environmental issues	64	Scores range from 0 to 64, higher scores indicate a positive attitude towards the environment	.67 using Cronbach's alpha
General Ecological Behavior scale	Measures a wide range of proenvironmental behaviors	40	Scores range from 0 to 40, the higher the score indicates more proenvironmental behavior engagement	.70 using a Rasch model
Self-Reported Proenvironmental Behavior Scale	Asks how often the respondent engages in environmental behaviors	10		.85 using Cronbach's alpha

Big 5 Personality Measure

The BFI (Appendix A) was developed by John and Srivastava (1999) and published in 1999. John and Srivastava developed this instrument to address the need for a short measuring tool that would allow efficient assessment of the five traits when measurement of the individual facets of the traits are not needed (John et al., 2008). The BFI measures the five personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism by creating a scale that averages each domain. The BFI consists of 44 questions that are on a Likert response scale. The BFI uses short phrases as

it has been found that short phrases that have been elaborated upon are answered more consistently than single adjectives from which people choose (Goldberg & Kilkowski, 1985). This is a self-report inventory where the taker may answer the following: 1 for *disagree strongly*, 2 *disagree a little*, 3 *neither agree or disagree*, 4 *agree a little*, to 5 *agrees strongly*. The BFI is in public domain and may be used for noncommercial research.

The items for the BFI were selected based upon a factor analysis using a large sample of college students (John et al., 2008). In samples from the United States and Canada, the Cronbach's alpha reliabilities ranged from .75 to .95 and averages above .80 (John et al., 2008). Three month test-retest reliability ranged from .80 to .90 with the average being .85 (John et al., 2008). Evidence of validity included extensive convergent correlations (John & Srivastava, 1999). Convergent correlations were measured with self-reports and three separate peer ratings on the BFI. Validity of convergent correlations were, .60 for openness, .47 for conscientiousness, .67 for extraversion, .48 for agreeableness, and .52 for neuroticism (John et al., 2008).

Environmental Concern and Behavior Measures

Self-Reported Proenvironmental Behavior Scale. The Self-Reported Proenvironmental Behavior Scale (Appendix B) is a short, 10 item measure developed by Schultz and Zelenzy (1988) in 1988. The behaviors on the measure were selected because they appeared numerous times in research performed in the United States, and ranked highly as environmentally responsible actions (Schultz & Zelenzy, 1988). The behaviors on this scale may be rated as being performed *never*, *rarely*, *sometimes*, *often*, *very often*,

and *not applicable*. A few examples from the measure are, “Picked up litter that wasn’t my own” or “Composted food scraps.”

The scale was given to 958 college students from a cross cultural sample: 187 students from Mexico, 78 from Nicaragua, 160 from Peru, 187 from Spain, and 345 from the United States (Schultz & Zelenzy, 1988). Reliability was evaluated using Cronbach’s alpha. Reliability was found to be .67 for the United States, .54 for Mexico, .52 for Nicaragua, and .58 for Spain (Schultz & Zelenzy, 1988). Schultz and Zelenzy (1988) admitted that their scale is very simple and strait forward, and suggested using it in conjunction with the General Ecological Behavior scale. This scale was chosen due to the simplicity of the measure, the proenvironmental behaviors can be easily determined by both the respondent and the administrator.

Validity for the 10 item scale was not provided. Schultz and Zeleny (1988) used a 56 item scale that measured self-transcendence, self-enhancement, openness, conservation, and responsibility. The New Environmental Paradigm scale was included in the original 56 item scale. The 10 items selected by the researchers for the Self-Reported Proenvironmental Scale focus only upon behavior.

General Ecological Behavior scale. Kaiser (1989) developed the General Ecological Behavior scale (GEB; Appendix C) to determine what subset of ecological behaviors a person performs most often (Kaiser, 1989). The seven separate subscales measure, Prosocial Behaviors, Ecological Garbage Removal, Water and Power Conservation, Ecologically Aware Consumer Behavior, Garbage Inhibition, Volunteering in Nature Protection Activities, and Ecological Transportation Use (Kaiser, 1998).

The GEB is considered to be the most widely gathered set of questions measuring a wide range of conservation behaviors, and therefore the GEB can be used to give an overall ecological behavior score (Kaiser & Wilson, 2000). For this study, the sum of the overall ecological score was used, which ranges from 0-40. The higher the score indicates more ecological behaviors being performed. A few examples of questions are, “I collect and recycle used paper” or “I use phosphate free laundry detergent.”

The reliability and validity of the GEB was assessed using a sample of 3,000 members of two Swiss transportation associations (Kaiser, 1998). Reliability was established using a Rasch model, and observed at .70, with the internal consistency at .74 (Kaiser, 1998). To test validity, criterion-related validity was performed. With criterion related validity the total score of the GEB was found to be correlated with practical ecological behaviors such as readiness to adopt easy ecological behaviors ($r = .41, p < .01$), readiness to adopt ecological behaviors that are difficult to implement ($r = .45, p < .01$), and willingness to accept government laws and prohibitions ($r = .46, p < .01$) (Kaiser et al., 1999). With three other ecological behaviors a smaller correlation was found with the GEB. Kaiser considered these behaviors harder to perform. For example, because many living areas do not provide sufficient public transportation people may not be able to limit travel by car. The estimated annual kilometers by car was correlated with the GEB ($r = -.29, p < .01$), estimated annual kilometers by airplane ($r = -.16, p < .01$), and financial contribution to ecological organizations ($r = .29, p < .01$) (Kaiser, Wolfing, & Fuhrer, 1999).

Environmental Concern Scale. The Environmental Concern Scale (ECS; Appendix D) was developed by Weigel and Weigel, in 1978, to evaluate concern about

environmental issues. The ECS is a 16 item questionnaire that uses a Likert type scale from 0 *strongly disagree*, to 4 *strongly agree*. Seven of the items are worded to reflect a positive attitude toward the environment (Weigel & Weigel, 1978). An example of a positive statement, “Courses focusing on the conservation of natural resources should be taught in the public schools.” The other 10 items are stated in a way that would reflect a negative attitude toward the environment (Weigel & Weigel, 1978). One example of a negatively worded statement, “The benefit from modern consumer products are more important than the pollution that results from their production and use.”

To establish reliability the measure was given, on two separate occasions, on randomly selected samples of 162 participants (Weigel & Weigel, 1978). The internal reliability was measured using Cronbach’s alpha and was found to be .85 (Weigel & Weigel, 1978). To measure validity 25 participants were asked to complete the measure, then six weeks later asked to complete the measure again. The results of the test-retest correlation was $r = .83, p < .01$ (Weigel & Weigel, 1978).

Data Analysis

For all data analysis of descriptive and inferential statistics SPSS Version 18 was used. If the participant did not finish all the measures, then the data from that participant were not analyzed. If the participants did not answer gender, age, or education level then that was reported as “did not answer”. These demographic questions are only being asked to help describe the sample. The questions for analysis are as follows:

1. Are the big-5 personality traits correlated with proenvironmental attitude and behaviors?

Hypotheses for Research Question 1 (Appendix A).

2. In multiple regression, which big five personality traits are associated with proenvironmental attitudes and/or behavior?

Hypotheses for Research Question 2 (Appendix B).

Descriptive Statistics

1. Gender, age, and educational level were asked of participants. These demographic variables were not used as IVs, but were used for general participant description. Both gender and educational level were analyzed as categorical variables. For gender, either male or female could be chosen. For education, the categories were level of education completed: high school, Bachelor's degree or equivalent, Master's degree or equivalent, Doctorate or equivalent, and other post-Doctoral degree. Age was measured as a continuous variable and the mean and standard deviation is reported.
2. The means, standard deviations, and number of subjects for each of the five personality traits are reported in a table.
3. The means, standard deviations, and number of subjects are also reported using a table. The Self-Reported Proenvironmental Behavior scale, and the General Ecological Behavior scale measure proenvironmental behaviors. The Environmental Concern Scale was used to measure attitudes.
4. A zero order correlation matrix was included to show the bivariate relationships between the five personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism and the Self-Reported Proenvironmental scale, the Proenvironmental Concern

Scale, and the General Behavior Scale. This showed how each personality trait is correlated with the three measures of environmental concern and behavior.

Inferential Statistics

All five of the big five personality traits were predictor variables used in the multiple regression analysis. The two-tailed test of significance and Pearson's correlation coefficient were also conducted. To test the hypothesis that big five personality traits were correlated with proenvironmental concern, the scores from the Big Five Inventory and Environmental Concern Scale were entered into SPSS. Then, the scores from the Big Five Inventory were entered with the scores from the Self-Reported Proenvironmental Scale to discover if there was a correlation between personality traits and behaviors with this measure. Last, the scores of the Big Five Inventory were entered and the scores of the General Ecological Behavior scale again to determine if there was a correlation between personality and proenvironmental behaviors. Multiple regression was also conducted to determine which personality trait had the most effect over proenvironmental attitudes and behaviors. Under the statistical options; estimates, confidence intervals, model fit, R^2 change, and descriptives were selected. Multiple regression allows for a specific order of the entries of the variables in order to test the effects of certain predictor variables that are independent of the other variables.

In multiple regression the R , R^2 , and R^2_{adj} , were reported after all data were entered using SPSS. All three evaluated if the linear combination of the predictor variables correlated with the criterion variables (Green & Salkind, 2008). R^2 explains the proportion of variance of proenvironmental concern and behavior that can be accounted

for by the five personality traits. R is the multiple correlation coefficient, and estimates the degree of association between the big five (IVs) and criterion variables, as measured by the Self-Reported Proenvironmental Behavior Scale, the General Ecological Behavior Scale, and the Environmental Concern Scale. Correlations are reported between -1.0 to +1.0 (Selloppan, 2013). R is conducted and reported for the hierarchical regression to determine if one or more traits accounted for variance in the model.

R^2 is measured by squaring R , and multiplying by 100, which provided a percentage of variance for the criterion variable that can be accounted for in the linear relationship to the predictor variables (Green & Salkind, 2008). R^2 estimated the percentage of the variance in the Self-Reported Proenvironmental Scale, the General Ecological Behavior scale, and Environmental Concern Scale, which can be accounted for by the Big Five traits together. R^2 does not take into account the number of variables used to explain the variance.

R_{adj} is calculated by taking into account the number of variables, and participants, and is considered the most useful value to use for percentage of variance in the model (Rizescu, 2013). R^2_{adj} improves the likelihood that the percentage of variance is not due to chance, and is calculated after R^2 . R_{adj} was performed and reported for both the multiple and hierarchical regression.

The p values state the statistical levels of the test. After p is calculated in SPSS, it was compared to the significance level of .05 for this study. The null hypotheses can be rejected if $p \leq .05$.

Summary

I sought to identify if personality traits were predictors of proenvironmental attitudes and behaviors. Each personality trait was entered by stepwise multiple regression using SPSS statistical software. I sought to discover if one personality trait was more likely to lead to proenvironmental attitudes and living a proenvironmental lifestyle. Data, collection, and screening are provided in Chapter 4. The results, for this study, are also reviewed in Chapter 4. Chapter 5 is a review of the findings, limitations and implications for positive social change.

Chapter 4: Results

Introduction

I attempted to replicate the finding of Hirsh (2010) who found that proenvironmental attitudes were correlated with the traits of openness, agreeableness, neuroticism, and conscientiousness. I also examined if the big five personality traits were predictors of proenvironmental behaviors. Chapter 4 is a description of data collection, a summary of the data, and statistical findings of the big five personality traits with the proenvironmental measures.

Data Collection

A total of 100 participants signed up for the study through the Walden Participant Pool. Two participants dropped out while taking the survey and their responses were not recorded. The total sample size was 98 participants. The study was posted in the pool during February 2014 and the final participant signed up in August 2014. Walden University sent out reminders at the beginning of quarters to announce new studies and remind students to participate in studies posted in the pool. During my Residency 4, I sent e-mails out to the attendants asking them to complete my survey. My original plan included asking the participants for a brief demographic survey, but it was not included in the survey. The participants were all associated with Walden University as a student, staff, or faculty member. The survey contained 114 questions. The average time a participant spent on answering the questions was 14 minutes; the least was 5 minutes, and the most being 36 minutes.

Data Screening

I assumed that participants would answer the questions honestly. Some of the questions about personality traits may not seem socially desirable to some participants. Five participants left two or more questions without answers. To ensure the unanswered questions would not skew the final analysis a minimum number of questions for each measure needed to be answered to be included. A 90% average was needed on each measure for the participants' answers to be used for data analysis. For example, the General Environmental Behavior scale had 40 items to answer. If 36 or more items were answered, than that participant's answer would be used in analysis. Prior to analysis, the assumption of normality was assessed by viewing a *p-p* scatterplot. Normal *p*-plots of standardized residual dependent variables were conducted for all three measures with big five traits. The scatterplot showed very little deviation from normality and the assumption was met. The assumption of homoscedasticity was assessed by viewing a residuals scatterplot. Scatterplots were created by comparing the standardized residuals and standardized predicted value. The scatterplots were consistent around a linear fit line. The scatterplot showed little sign of heteroscedasticity and the assumption was met. Variance inflation factors (VIFs) were examined to assess for multicollinearity with variance inflation factors. No variance inflation factors value were above 2.0, therefore, the assumption of multicollinearity was met.

Data for Each Big 5 Personality Trait

A score of 5.0 is the highest a person can score in a personality trait using the BFI. The range of the scores for the trait openness was 1.9 to 5.0, with the mean score of 3.84 ($SD = .61$). For the trait of conscientiousness the scores ranged from 2.11 to 5.00,

with the mean score of 4.06 ($SD = .62$). Extraversion ranged from 2.13 to 4.89; the mean score was 3.43 ($SD = .55$). The range of the scores for agreeableness were 2.56 to 5.0; the mean score was 4.01 ($SD = .57$). Neuroticism scores ranged from 1.13 to 4.75; the mean score was 2.67 ($SD = .80$). Table 2 reviews the means of the five personality traits, the standard deviations of these traits, and the number of participants that were used in these measurements.

Table 2

Means, Standard Deviations, and Number of Participants for Traits Measured on BFI

Trait	<i>M</i>	<i>SD</i>	<i>N</i>
Openness	3.84	0.61	98
Conscientiousness	4.06	0.62	98
Extraversion	3.43	0.55	97
Agreeableness	4.01	0.57	98
Neuroticism	2.67	0.80	98

Data for Environmental Measures

The mean scores on the General Ecological Behavior scale ranged from 0.35 to 0.83, and the mean was 0.57 ($SD = 0.12$). The highest mean for this measure could have been a 1.00. Scores on the Environmental Concern Scale ranged from 1.50 to 3.94; the mean was 2.84 ($SD = .56$). The highest mean score that could have been attained on this measure was a 5.0. The scores for the Self-Reported Environmental Concern Scale ranged from 1.00 to 5.00; the highest mean score that was attainable for this measure was 5.00. The mean was 3.30 ($SD = .90$). Table 3 reviews the means for the environmental measures, the standard deviations of these measures, and the number of participants that completed the measures.

Table 3

Means, Standard Deviations, and Number of Participants for Environmental Measures

Measure	<i>M</i>	<i>SD</i>	<i>N</i>
General Environmental Behavior	.57	.12	97
Environmental Concern Scale	2.84	.56	96
Self-Reported Environmental Concern Scale	3.30	.90	98

Correlation

The participants first completed the 10-item Self-Reported Proenvironmental Behavior Scale (Schultz & Zeleny, 1988). Second, the 40-item General Ecological Behavior (Kaiser, 1989) scale was completed, and then the 16-item Environmental Concern Scale (Weigel & Weigel, 1978) was completed to conclude the environmental measures. Last, the BFI (John & Srivastava, 1999) was finished, which concluded all of the measures.

The scores for each environmental measure were totaled, and each participant was given a mean score on all three measures. The BFI was scored by the traits of openness, conscientiousness, agreeableness, extraversion, and neuroticism. Each participant was provided a mean score for each big five personality trait. The hypotheses for correlations are listed below:

1. Are the big-5 personality traits correlated with proenvironmental attitude and behaviors?

Hypotheses for Research Question 1 (Appendix A).

Correlations between the big five personality traits and the environmental measures are reviewed in table 4.

Table 4

Correlations Between Personality Traits and Proenvironmental Concern and Behaviors

	General Ecological Behavior Scale	Environmental Concern Scale	Self-Reported Proenvironmental Concern Scale
	<i>n</i> =94	<i>n</i> =93	<i>n</i> =95
Openness	.31**	.36**	.41**
Conscientiousness	.08	.03	.15
Extraversion	.14	-.05	.16
Agreeableness	.13	.17	.26**
Neuroticism	-.15	.06	-.20

Note *Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

Correlation coefficients were computed among the five traits and the proenvironmental measures. A p value of .05 was required for significance. The results of the correlation analysis are shown in Table 4. For proenvironmental behavior, the traits of agreeableness, $r(93) = .26, p < .05$, and openness, $r(93) = .41, p < .01$, were significant predictors of proenvironmental behavior. Openness $r(93) = .31, p < .01$ was a predictor of general ecological behavior. For environmental concern, the only significant predictor trait was openness, $r(91) = .36, p < .01$. The trait of openness was correlated with general ecology. The traits of agreeableness and openness were correlated with proenvironmental behaviors and environmental concern. Therefore, the null hypothesis H_{01} which states the personality trait of openness does not correlate with proenvironmental behavior can be rejected. The null hypothesis H_{04} that states agreeableness is not correlated with proenvironmental concern may be rejected. For general ecology, the null hypothesis H_{06} may be rejected, which states that general ecology is not correlated with openness. The null hypothesis H_{011} may also be rejected which states environmental concern is not correlated with openness.

Regression

The following hypotheses were tested in three separate multiple regressions analyses. The first multiple regression used the Self-Reported Proenvironmental Scale as the dependent variable. The five personality traits were entered as the dependent variables. R^2 determined the amount of variance of the model. The Pearson correlations were examined to determine if a trait was significant in the model. This process was repeated with both the General Ecological Behavior scale and the Environmental Concern Scale.

2. In multiple regression, which big five personality traits are associated with proenvironmental attitudes and/or behavior?

Hypotheses for Research Question 2 (Appendix B).

Self-Reported Proenvironmental Behavior Scale

Standard multiple regression was conducted to determine the accuracy of the independent variables openness, conscientiousness, extraversion, agreeableness, and neuroticism for predicting proenvironmental behaviors. Regression results indicated the model significantly predicts proenvironmental behaviors, $R^2 = .185$, $R^2_{adj} = .139$, $F(5,89) = 4.04$, $p < .002$. This model accounts for 18.5% of variance in environmental behaviors. A summary of regression coefficients is presented in table 4 which indicates that the personality trait openness was the only variable that significantly attributed to the model. The null hypothesis H_{016} can be rejected, which states, the personality trait of openness is not associated with proenvironmental behaviors. Coefficients for the model of variance for the Self-Reported Proenvironmental Scale are reviewed in table 5.

Table 5

Coefficients for Model Variance of Self-Reported Proenvironmental Behavior Scale

	B	B	t	p
Openness	.53	.37	3.34	.00
Conscientiousness	.09	.06	.53	.60
Extraversion	.00	.00	.01	.99
Agreeableness	.08	.06	.47	.64
Neuroticism	-.06	-.06	-.47	.64

General Ecological Behavior Scale

The second multiple regression, was conducted to determine if the independent variables of openness, conscientiousness, extraversion, agreeableness, and neuroticism, predicted proenvironmental behaviors with the general ecological behavior. Data screening led to the elimination of one case. Multiple regression results indicated that the overall model was marginally significant, $R^2 = .108$, $R^2_{adj} = .057$, $F(5, 88) = 2.133$, $p < .069$. This model accounts for 10.8% of the variance for proenvironmental behavior. A summary of regression coefficients is presented in Table 6, and indicates that the personality trait openness was a significant contributor to the model. The null hypothesis H_{021} may be rejected. The hypothesis states, the personality trait openness is not associated with general ecology.

Table 6

Coefficients for the Model Variance of the General Ecological Behavior Scale

	B	B	t	p
Openness	.06	.02	3.53	.00
Conscientiousness	.01	.01	.52	.61
Extraversion	.01	.03	-1.23	.22
Agreeableness	-.01	.03	.65	.52
Neuroticism	-.01	.02	1.37	.18

Environmental Concern Scale

The third multiple regression was completed to determine whether the predictor variables of openness, conscientiousness, extraversion, agreeableness, and neuroticism could significantly predict proenvironmental attitudes on the Environmental Concern Scale. Data screening led to the deletion of one case. Regression results indicated that the model predicts proenvironmental attitudes, $R^2 = .173$, $R^2_{adj} = .125$, $F(5, 87) = 3.69$, $p < .005$. This model accounts for 17.3% of the variance in proenvironmental attitudes. A summary of regression coefficients is presented in Table 7, and indicates that openness, contributed significantly to the model. Therefore three null hypotheses can be rejected. H_{027} can be rejected because openness was found to be associated with environmental concern.

Table 7

Coefficients for the Model Variance of the Environmental Concern Scale

	B	B	t	p
Openness	.36	.10	3.53	.00
Conscientiousness	.06	.06	.52	.60
Extraversion	-.14	.11	-1.23	.22
Agreeableness	.76	.08	.65	.52
Neuroticism	.12	.16	1.35	.18

Summary of Results

Chapter 4 included the correlations, and the ability of big five personality traits to predict proenvironmental behaviors and attitudes. I was not able to reproduce the correlations that Hirsh (2010) found, that proenvironmental attitudes were correlated with openness and conscientiousness. A correlation between the trait of openness $r(96) = .211$, $p < .05$, and agreeableness $r(96) = .392$, $p \leq .392$, were significant in proenvironmental

behavior. For general ecological behavior, there was correlation with the personality trait openness, $r(96) = .318, p < .001$. I found only the trait of openness, $r(94) = .354, p < .01$, to be correlated with environmental concern.

When regression was completed openness, $\beta = .395, t(87) = 3.537, p = .001$, was a significant predictor of environmental concern. Regression revealed the personality trait of openness was significantly related to environmental concern and environmental behavior on all three measures: the General Ecological Behavior scale, $r(92) = .32, p < .01$; the Self-Reported Proenvironmental Behavior Scale, $r(93) = .26, p < .05$; and the Environmental Concern Scale, $r(91) = .36, p < .01$. Using the General Ecological Behavior scale, the trait openness, $\beta = .309, t(88) = 2.68, p = .009$ was the only significant predictor of proenvironmental behavior using multiple regression. This differed from the correlations performed in this study, which found both agreeableness and openness to be associated with proenvironmental behavior. Regression analysis performed on the Self-Reported Proenvironmental Behavior scale revealed that, the trait openness, $\beta = .366, t(89) = 3.339, p = .001$, was again the only trait found to be a significant predictor of proenvironmental behavior. .

This chapter contained a description of the results of the data analysis that addressed the two research questions. Data collection and data screening were reviewed. Descriptive statistics were provided for the predictor and criterion variables. The correlations were reviewed and further described. Regression models were also evaluated and explained in Chapter 4. Chapter 5 is a summary of results. Implications for social change will also be discussed. Lastly, recommendations for future research will be presented.

Chapter 5: Discussion

Introduction

This study was a quantitative, cross-sectional study in which I examined the correlations between the big five personality traits and proenvironmental attitudes and behaviors. Multiple regression was also performed to determine which personality traits were predictor variables of proenvironmental attitudes and behaviors. I attempted to replicate the finding of Hirsh (2010) that the big five personality traits of agreeableness, openness, neuroticism, and conscientiousness were predictors of proenvironmental attitudes. I aimed to examine if big five personality traits could be used as predictors of proenvironmental behaviors.

This chapter is a review of key findings and the knowledge that can be contributed to understanding if big five personality traits may predict proenvironmental attitudes and behaviors. Chapter 5 is also a review of the limitation of this study. Implications for social change will be considered, along with recommendations for future research.

Interpretation of Findings

Proenvironmental Attitudes

In all three of the environmental measures used in this study, the big five personality trait of openness was consistently correlated with environmental concern. When multiple regression was performed using the Environmental Concern Scale, I was not able to reproduce Hirsch's (2010) findings about the big five personality traits and proenvironmental attitudes. Hirsh found that the big five personality traits of openness, conscientiousness, agreeableness, and neuroticism were predictors of proenvironmental

attitudes. My study did differ from Hirsh's in that he used structured equation modeling that targeted the model source of error in the data set. Hirsh's model targeted acquiescence bias, and halo bias, and he observed the corrections among the big five. My study was a simpler correlation and multiple regression model.

When using the Environmental Concern Scale, I found this model accounted for 17.3% of the variance in proenvironmental concern. I found the trait of openness to be a predictor of positive environmental attitudes. People who score high in the trait of openness tend to be more open to new ideas and experiences. People who are open differ in the type of information they seek and how they respond (Doherty & Clayton, 2011). People who score high in openness have also shown to be highly connected to nature. It appears that people who score high in openness are more susceptible to proenvironmental messages, which could be explained by their feelings of nature connectedness. These reasons may explain the significant correlation of proenvironmental attitudes and the big five trait of openness.

Behaviors

When the correlations were performed between the big five personality traits and the Self-Reported Proenvironmental Behavior Scale and the General Ecological Behavior scale, the traits of openness and agreeableness were found to be significant.

Agreeableness has been linked to people who will sacrifice their own interests for the gain of the group (Cumberland-Li et al., 2004). People who score high in agreeableness are more likely to perform prosocial behaviors (Gerber et al., 2011). Highly agreeable people tend to be influenced by social norms as reviewed earlier in a study that was about increasing the reuse of towels in hotels (Goldstein et al., 2008). This may explain why

those who scored high in agreeableness were more likely to perform proenvironmental behaviors.

People who rate high in the big five trait of openness enjoy new ideas and experiences (Roccas et al., 2002). Perform new behaviors (i.e., taking public transportation, limiting water use, or purchasing sustainable products), and can be uncomfortable when previous behaviors have become habitual (Gifford, 2011). A person must step outside his or her comfort zone and be willing to try new behaviors.

When proenvironmental behaviors were examined with multiple regression, only the big five personality trait of openness was a predictor. Using the Self-Reported Proenvironmental Behavior Scale, 18.5% of the variance in proenvironmental behaviors was accounted for by the big five personality traits. The General Ecological Behavior scale did not display as large of a variance when predicting proenvironmental behavior. I found 10.8% of the variance was related to environmental behavior as predicted by the big five personality traits. According to the findings, openness may be used as a predictor of proenvironmental behaviors. Researchers have found that the trait of openness is highly correlated with feelings of connectedness to nature, which may lead to proenvironmental behaviors (Nisbet, Zelenski, & Murphy, 2009). People with a high connected to nature value protection and the preserving of nature (Clayton & Meyers, 2009).

There is a need for further studies on big five personality traits and proenvironmental attitude and behaviors. I found openness to be the only predictor of proenvironmental attitudes. The findings were mixed depending upon what scale was used for proenvironmental behaviors. The Self-Reported Proenvironmental Behavior

scale indicated the big five personality traits of openness and agreeableness were correlated with proenvironmental behavior. When multiple regression was performed the trait of agreeableness no longer was significant. Using the General Ecological Behavior scale openness was the only significant correlation found. Further evaluations need to be conducted to determine if the big five personality traits may or may not be used to predict proenvironmental attitudes or behaviors.

Limitations

This was an exploratory study that was meant to provide an initial line of study on big five personality traits and proenvironmental attitudes and behaviors. The sample in the current study was limited to 100 participants from the Walden Participant Pool. Due to access, money, and time constraints of my study, seeking more participants would have been time prohibitive. I aimed to replicate Hirsh's (2010) findings, but, I was not able to do so. The sample size may have been undersized to detect small effects. The study by Hirsh involved 2,960 participants. Hirsh stated that, when smaller samples were used, the trait of conscientiousness and neuroticism were not found to be a significant predictor of environmental concern, but in a larger sample he found a small but significant correlation with the trait conscientiousness and neuroticism.

I used the participant pool from Walden University. This sample may not be a representation of the general population. When finding the mean of the big five personality traits in this study, the highest mean was conscientiousness at 4.06. This could be due to both determination and having strong self-discipline being related to student success, which is a part of the trait conscientiousness (John et al., 2008). The sample from Walden may possess more education than the general public.

I do not know the genders of the participants in the study. I do not know if there was an equal amount of male and females who participated. I also do not know the age range of the participants. It may have been skewed to be younger or older which also may have had an effect on results.

Implications for Social Change

I focused on proenvironmental attitudes and behaviors being associated with big five personality traits. I showed that the trait of openness was a predictor for environmental concern. The traits of openness and agreeableness were predictors of proenvironmental behavior. Not only were big five predictors of proenvironmental attitudes, but traits can also be associated with proenvironmental behaviors.

There is a need for further studies on personality traits and proenvironmental behaviors. It is no longer acceptable to question whether climate change is occurring, it is already happening (Gifford, 2009). The environmental issues have been created by human behavior, and to undo the damage we have caused will take an all-encompassing change in behavior (Zeleny & Schultz, 2000). Psychologists have long studied behaviors and what influence behaviors.

The trait of openness was found to be predictive in proenvironmental behaviors when multiple regression was performed. Psychologists can further break this trait apart to discover what particular facet leads to proenvironmental behaviors. Part of the trait of openness, that is, the willingness to change and be receptive to behavior changes, may make this trait a predictor of proenvironmental behavior. It is known that behaviors that have become highly routine are difficult to change, and many people find change uncomfortable (Gifford, 2011).

“Environmental and social scientists must work more together in order to enhance the understanding of environmental problems. Together, they must design public campaigns that provide accurate information” (Van Vugt, 2009, p.169). Knowing what personality traits are susceptible to messages and which traits are not, may help psychologists design messages, education, and motivation for proenvironmental behavioral change. According to Kazdin (2009), psychologists need to integrate their knowledge of how people perceive messages, and how these messages can have the biggest impact.

Recommendations

Further studies should be conducted on the issue of personality traits and proenvironmental attitudes and behaviors. Fostering sustainable behavior is an important issue for psychologists (Kazdin, 2011). Because climate change is an important topic this line of research should be continued. I was able to show a significant correlation between proenvironmental behavior and the big five personality traits of openness and agreeableness. This was exploratory research and the study would need to be replicated. A study that uses a larger sample should be conducted.

Looking further into traits that correlate with proenvironmental behaviors, and what specifically about that trait, may be beneficial to understanding the motivation for proenvironmental behaviors. If psychologists could understand what specific facet of the personality traits of openness and agreeableness lead people to act more with proenvironmental behaviors, this may also lead to understand those who don't act with those behaviors. A better understanding of big five personality traits may be part of guiding people to more proenvironmental behaviors.

Conclusion

I focused on correlations between the big five personality traits and proenvironmental attitudes and behaviors. A multiple regression was also conducted to discover if one or more traits could be predictive of proenvironmental attitudes and behaviors. Significant findings were the traits of agreeableness and openness were found to be correlated with proenvironmental attitudes and behaviors. When multiple regression was conducted the big five personality trait of openness was determined to be a predictor of proenvironmental attitudes. Only the trait of openness had predictive effect on proenvironmental behaviors.

Such findings do not mean that other big five personality traits are not predictors of proenvironmental behaviors. This means that with this sample, at this time, other personality traits were not found to be predictive of proenvironmental behaviors. This was only an initial study. The issue remains that people's behaviors are not changing quickly enough to maintain a sustainable environment.

This line of research deserves to be continued due to mixed finding of studies that have been completed thus far. Climate change is one the most paramount challenges facing people today (Swim et al., 2011). Psychologists can be in the forefront of the promotion of proenvironmental behavior (Kazdin, 2009). At the present time, psychologists have the ability of guiding the issues of proenvironmental change. Big five personality traits may be one of the keys to environmental change.

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Appendix A: Hypotheses for Correlations

Hypotheses 1-5: zero-order correlations with proenvironmental behavior

*H*₀₁: There is no correlation between openness and proenvironmental behavior.

*H*₁₁: There is a correlation between openness and proenvironmental behavior.

*H*₀₂: There is no correlation between conscientiousness and proenvironmental behavior.

*H*₁₂: There is a correlation between conscientiousness and proenvironmental behavior.

*H*₀₃: There is no correlation between extraversion and proenvironmental behavior.

*H*₁₃: There is a correlation between extraversion proenvironmental behavior.

*H*₀₄: There is no correlation between agreeableness and proenvironmental behavior.

*H*₁₄: There is a correlation between agreeableness and proenvironmental behavior.

*H*₀₅: There is no correlation between neuroticism and proenvironmental behavior.

*H*₁₅: There is a correlation between neuroticism and proenvironmental behavior.

Hypotheses 6-10: zero-order correlations with general ecological behavior

*H*₀₆: There is no correlation between openness and general ecological behavior.

*H*₁₆: There is a correlation between openness and general ecological behavior.

*H*₀₇: There is no correlation between conscientiousness and general ecological behavior.

*H*₁₇: There is a correlation between conscientiousness general ecological behavior.

*H*₀₈: There is no correlation between extraversion and general ecological behavior.

*H*₁₈: There is a correlation between extraversion and general ecological behavior.

*H*₀₉: There is no correlation between agreeableness and general ecological behavior.

*H*₁₉: There is a correlation between agreeableness and general ecological behavior.

*H*₀₁₀: There is no correlation between neuroticism and general ecological behavior.

*H*₁₁₀: There is a correlation between neuroticism and general ecological behavior.

Hypotheses 11-15: zero-order correlations with environmental concern

*H*₀₁₁: There is no correlation between openness and environmental concern.

*H*₁₁₁: There is a correlation between openness and environmental concern.

*H*₀₁₂: There is no correlation between conscientiousness and environmental concern.

*H*₁₁₂: There is a correlation between conscientiousness and environmental concern.

*H*₀₁₃: There is no correlation between extraversion and environmental concern.

*H*₁₁₃: There is a correlation between extraversion and environmental concern.

*H*₀₁₄: There is no correlation between agreeableness and environmental concern.

*H*₁₁₄: There is a correlation between agreeableness and environmental concern.

*H*₀₁₅: There is no correlation between neuroticism and environmental concern.

*H*₁₁₅: There is a correlation between neuroticism and environmental concern.

Appendix B: Hypotheses for Multiple Regression

Hypotheses 16-20: multiple regression of proenvironmental behavior on the big-5 personality traits

H₀16: After accounting for conscientiousness, extraversion, agreeableness, and neuroticism, openness is not associated with proenvironmental behavior.

H₁16: After accounting for conscientiousness, extraversion, agreeableness, and neuroticism, openness is associated with proenvironmental behavior.

H₀17: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is not associated with proenvironmental behavior.

H₁17: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is associated with proenvironmental behavior.

H₀18: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is not associated with proenvironmental behavior.

H₁18: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is associated with proenvironmental behavior.

H₀19: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is not associated with proenvironmental behavior.

H₁19: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is associated with proenvironmental behavior.

H₀20: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is not associated with proenvironmental behavior.

H₁20: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is associated with proenvironmental behavior.

Hypotheses 21-25: multiple regression of general ecological behavior on the big-5 personality traits

H₀21: After accounting conscientiousness, extraversion, agreeableness, and neuroticism, openness is not associated with general ecological behavior.

H₁21: After accounting for conscientiousness, extraversion, agreeableness, and neuroticism, openness is associated with general ecological behavior.

H₀22: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is not associated with general ecological behavior.

H₁22: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is associated with general ecological behavior.

H₀23: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is not associated with general ecological behavior.

H₁23: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is associated with general ecological behavior.

H₀24: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is not associated with general ecological behavior.

H₁24: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is associated with general ecological behavior.

H₀25: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is not associated with general ecological behavior.

H₁25: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is associated with general ecological behavior.

Hypotheses 26-30: multiple regression of environmental concern on the big-5 personality traits

H₀₂₆: After accounting conscientiousness, extraversion, agreeableness, and neuroticism, openness is not associated with environmental concern.

H₁₂₆: After accounting for conscientiousness, extraversion, agreeableness, and neuroticism, openness is associated with environmental concern.

H₀₂₇: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is not associated with environmental concern.

H₁₂₇: After accounting for openness, extraversion, agreeableness, and neuroticism, conscientiousness is associated with environmental concern.

H₀₂₈: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is not associated with environmental concern.

H₁₂₈: After accounting for openness, conscientiousness, agreeableness, and neuroticism, extraversion is associated with environmental concern.

H₀₂₉: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is not associated with environmental concern.

H₁₂₉: After accounting for openness, conscientiousness, extraversion, and neuroticism, agreeableness is associated with environmental concern.

H₀₃₀: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is not associated with environmental concern.

H₁₃₀: After accounting for openness, conscientiousness, extraversion, and agreeableness, neuroticism is associated with environmental concern.

Appendix C: Big Five Inventory

How I am in general

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

1	2	3	4	5
Strongly Disagree	Disagree a little	Neither agree or disagree	Agree a little	Agree Strongly

I am someone who...

1. _____ Is talkative
2. _____ Tends to find fault with others
3. _____ Does a thorough job
4. _____ Is depressed, blue
5. _____ Is original, comes up with new ideas
6. _____ Is reserved
7. _____ Is helpful and unselfish with others
8. _____ Can be somewhat careless
9. _____ Is relaxed, handles stress well.
10. _____ Is curious about many different things
11. _____ Is full of energy
12. _____ Starts quarrels with others
13. _____ Is a reliable worker
14. _____ Can be tense
15. _____ Is ingenious, a deep thinker
16. _____ Generates a lot of enthusiasm
17. _____ Has a forgiving nature
18. _____ Tends to be disorganized
19. _____ Worries a lot
20. _____ Has an active imagination
21. _____ Tends to be quiet
22. _____ Is generally trusting
23. _____ Tends to be lazy
24. _____ Is emotionally stable, not easily upset
25. _____ Is inventive
26. _____ Has an assertive personality
27. _____ Can be cold and aloof
28. _____ Perseveres until the task is finished
29. _____ Can be moody
30. _____ Values artistic, aesthetic experiences
31. _____ Is sometimes shy, inhibited
32. _____ Is considerate and kind to almost everyone
33. _____ Does things efficiently

34. _____ Remains calm in tense situations
35. _____ Prefers work that is routine
36. _____ Is outgoing, sociable
37. _____ Is sometimes rude to others
38. _____ Makes plans and follows through with them
39. _____ Gets nervous easily
40. _____ Likes to reflect, play with ideas
41. _____ Has few artistic interests
42. _____ Likes to cooperate with others
43. _____ Is easily distracted
44. _____ Is sophisticated in art, music, or literature

Appendix D: Self-Reported Proenvironmental Behaviors Scale

Please indicate how often you have done each of the following in the last year.

- | 1 | 2 | 3 | 4 | 5 | NA |
|-------|--------|--|-------|------------|----------------|
| Never | Rarely | Sometimes | Often | Very often | Not applicable |
| _____ | 1. | Looked for ways to reuse things | | | |
| _____ | 2. | Recycled newspapers | | | |
| _____ | 3. | Recycles cans or bottles | | | |
| _____ | 4. | Encouraged friends or family to recycle | | | |
| _____ | 5. | Purchased products in reusable or recyclable containers | | | |
| _____ | 6. | Picked up litter that was not your own | | | |
| _____ | 7. | Composted food scraps | | | |
| _____ | 8. | Conserved gasoline by walking or bicycling | | | |
| _____ | 9. | Written a letter supporting an environmental issues | | | |
| _____ | 10. | Voted for a candidate who supported environmental issues | | | |

Appendix E: General Ecological Behavior

Please indicate whether or not they have ever engaged in a particular behavior (Yes or No).

- _____ 1. Sometimes I give change to panhandlers.
- _____ 2. From time to time I contribute money to charity.
- _____ 3. If an elderly or disabled person enters a crowded bus or subway, I offer him or her my seat.
- _____ 4. If I were an employer I would consider hiring a person previously convicted of a crime.
- _____ 5. In fast food restaurants, I usually leave the tray on the table.
- _____ 6. If a friend or relative had to stay in hospital for a week or two for minor surgery (e.g. appendix, broken leg), I would visit him or her.
- _____ 7. Sometimes I ride public transportation without paying a fare.
- _____ 8. I would feel uncomfortable if Turks lived in the apartment next door.
- _____ 9. I put dead batteries in the garbage.
- _____ 10. After meals, I dispose of leftovers in the toilet.
- _____ 11. I bring unused medicine back to the pharmacy.
- _____ 12. I collect and recycle used paper.
- _____ 13. I bring empty bottles to a recycling bin.
- _____ 14. I prefer to shower rather than to take a bath.
- _____ 15. In the winter, I keep the heat on so that I do not have to wear a sweater.
- _____ 16. I wait until I have a full load before doing my laundry.
- _____ 17. In the winter, I leave the windows open for long periods of time to let in fresh air.
- _____ 18. I wash dirty clothes without prewashing.
- _____ 19. I use fabric softener with my laundry.
- _____ 20. I use an oven-cleaning spray to clean my oven.
- _____ 21. If there are insects in my apartment I kill them with a chemical insecticide.
- _____ 22. I use a chemical air freshener in my bathroom.
- _____ 23. I use chemical toilet cleaners.

- _____24. I use a cleaner made especially for bathrooms rather than an all-purpose cleaner.
- _____25. I use phosphate-free laundry detergent.
- _____26. Sometimes I buy beverages in cans.
- _____27. In supermarkets, I usually buy fruits and vegetables from the open bins.
- _____28. If I am offered a plastic bag in a store I will always take it.
- _____29. For shopping, I prefer paper bags to plastic ones.
- _____30. I usually buy milk in returnable bottles.
- _____31. I unwrap useless (i.e. nonfunctional packages) in the store.
- _____32. I often talk with friends about problems related to the environment.
- _____33. I am a member of an environmental organization.
- _____34. In the past, I have pointed out to someone his or her unecological behavior.
- _____35. I sometimes contribute financially to environmental organizations.
- _____36. I do not know whether I may use leaded gas in my automobile.
- _____37. Usually I do not drive my automobile in the city.
- _____38. I usually drive on freeways at speeds under 100 k.p.h. (62.5 m.p.h).
- _____39. When possible in nearby areas (around 30 km, i.e. 18.75 miles), I use public transportation or ride a bike.
- _____40. My automobile is ecologically sound.

Appendix F: Environmental Concern Scale

On a scale of 0 (strongly disagree) to 4 (strongly agree), please rate the degree to which you agree or disagree with the following statements:

- | | | | | |
|-------------------|---|---|---|----------------|
| 0 | 1 | 2 | 3 | 4 |
| Strongly Disagree | | | | Strongly Agree |
-
- _____ 1. The federal government will have to introduce harsh measures to halt pollution since people will not regulate themselves.
 - _____ 2. We should not worry about killing too many game animals because in the long run things will balance out.
 - _____ 3. I'd be willing to make personal sacrifices for the sake of slowing down pollution even though the immediate results may not seem significant.
 - _____ 4. Pollution is not personally affecting my life.
 - _____ 5. The benefits of modern consumer products are more important than the pollution that results from their production and use.
 - _____ 6. We must prevent any type of animal from becoming extinct, even if it means sacrificing some things for ourselves.
 - _____ 7. Courses focusing on the conservation of natural resources should be taught in the public schools.
 - _____ 8. Although there is continual contamination of our lakes, streams, and air, nature's purifying processes soon return them to normal.
 - _____ 9. Because the government has such good inspection and control agencies, it's very unlikely that pollution due to energy production will become excessive.
 - _____ 10. The government should provide each citizen with a list of agencies and organizations to which citizens could report grievances concerning pollution.
 - _____ 11. Predators such as hawks, crows, skunks, and coyotes which prey on farmer's grain crops and poultry should be eliminated.
 - _____ 12. The currently active anti-pollution organizations are really more interested in disrupting society than they are in fighting pollution.
 - _____ 13. Even if public transportation was more efficient than it is, I would prefer to drive my car to work.
 - _____ 14. Industry is trying its best to develop effective anti-pollution technology.
 - _____ 15. If asked, I would contribute time, money, or both to an organization like the Sierra Club that works to improve the quality of the environment.

_____16. I would be willing to accept an increase in my family's expenses of \$100 next year to promote the wise use of natural resources.

Appendix G: Demographic Description

1. Gender Male____ Female_____

2. Age_____

3. Education Level

High School Diploma_____

Associate's Degree or equivalent_____

Bachelor's Degree or equivalent_____

Master's Degree or equivalent_____

Doctorate or Equivalent_____

Appendix H: Consent Form

CONSENT FORM

You are invited to take part in a research study of The Big Five Personality traits which are Openness, Conscientiousness, Agreeableness, Extraversion, and Neuroticism and how those traits are associated with proenvironmental attitudes and behaviors. The researcher is inviting all students in the Walden Participant Pool to be in the study. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Tara Wuertz, who is a doctoral student in Psychology at Walden University.

Background Information:

The purpose of this study is to measure the Big Five personality traits of Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism using the Big Five Inventory. There will be three environmental surveys that measure proenvironmental attitudes and behaviors. These measure will be correlated to discover if any traits are associated with proenvironmental attitudes and behaviors.

Procedures:

If you agree to be in this study, you will be asked to:

- Fill out four surveys. The overall time should take an hour or less of your time. This is a onetime participation study.
- The first measure is the Big Five Inventory. This measures personality traits. The questionnaire has 44 items which you rank if you agree or disagree that statements describe you from 1 to 5. This should be completed in 20 minutes or less.
Sample questions are 1. Is talkative ___ 2. Is reserved ___
- The second measure is the Self-Reported Proenvironmental Behaviors scale which asks how often you participate in proenvironmental behaviors. This is a 10 item questionnaire that should take more than 10 minutes. A few sample questions 1. Recycles newspapers ___ 2. Composts food scraps ___
- The third measure is the General Ecological Behaviors scale. This questionnaire has 40 items that are answered in a yes/no format and take about 15 minutes.
Sample questions 1. I collect and recycle paper ___ 2. I throw dead batteries in the trash ___

- The last measure is the Environmental Concern Scale. The questionnaire has 16 items that asks you to rank from 0 to 4 if you agree or disagree with statements.
Sample question 1. I will be willing to make personal sacrifices to slow down pollution even though the immediate results may not seem significant? _____

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one at Walden University will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind during or after the study. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as answering questions about yourself and your beliefs about the environment. Being in this study would not pose risk to your safety or wellbeing.

You may learn new behaviors that could lead to protection of the environment and be inspired to try new behaviors.

Privacy:

Any information you provide will be kept anonymous. I will not know who participated in this study. A number will be assigned to participants. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by storing information on a USB that I will only have access. The USB will be locked in a cabinet when I am not personally using it. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone at **760-835-8941** or e-mail at tara.wuertz@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368, extension 1210. Walden University's approval number for this study is **IRB**

will enter approval number here and it expires on **IRB will enter expiration date.**

Please print or save this consent form for your records.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By clicking the link below I understand I consent to this study and have read this form. I understand that I am agreeing to the terms of this study.

CURRICULUM VITAE
TARA WUERTZ

PROFESSIONAL EXPERIENCE

August 2000 – June 2014

Coachella Valley Unified School District
Teacher for kindergarten, 3rd, 4th, 5th, and 6th grade
Grade Level Leader
Gifted and Talented Coordinator, teacher, and after school program provider
Ruby Payne certificated and trainer

June 2004 – August 2008

Reading Lions Center- Sacramento Department of Education
Provided training for teachers on state adopted Houghton Mifflin reading curriculum during week long institutes

September 1998- August 2000

Los Angeles Unified School District
Teacher of kindergarten and 4/5th grade combination
Tutor during off track time

June 1997 – May 1998

Shelter from the Storm, battered women's Shelter
Woman's advocate
Preschool teacher
Created program and provided program for local teens on abuse awareness

PROFESSIONAL PRESENTATIONS

Wuertz, T. (2104). Personality Traits Associated with Environmental Concern. Poster session presented at Walden University Graduation Ceremony, National Harbor, MD.

EDUCATION

September 2009 -

Ph.D. General Research and Evaluation Psychology, Walden University (Pending)
Dissertation-*Personality Traits Associated with Environmental Concern*

December 2006

Master of Arts, California State

University San Bernardino, Curriculum
And Instruction
Thesis Research: *A Study of Gifted
Education*

December 2002

Multiple Subject Teaching Credential-
California State University Northridge

December 1994

Bachelor of Arts, University of Kansas
Psychology

CREDENTIALS

Multiple Subject Teaching Credential
Gifted and Talented Education Teaching
Credential
Great Books- Shared Inquiry Leader
A Framework for Understanding Poverty
Trainer