



# Big Five Personality Traits influencing Secondary Students' Environmental Literacy in Ondo State, Nigeria

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**Abstract:** The human population growth and technological advancement have spurred radical changes in the global environments that are harmful. Unfortunately, scholars have continued to tackle these environmental problems without paying attention to the personality factors responsible for such phenomena. It is consequent on these that this study investigated the combined and independent effects of big five personality factors namely openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism on secondary school students' environmental literacy. A field-based approach was adopted to collect quantitative data through the use of a questionnaire from 462 secondary school students that were randomly selected in thirteen secondary schools in Ondo State, Nigeria. Multiple regression statistical analysis utilized showed that the independent variables were effective predictors of secondary school students' environmental literacy. These findings were limited to subjects in thirteen secondary schools in Ondo State, Nigeria, as well as the personality factors investigated. These findings provided evidence on the need for secondary school teachers, counselling and educational psychologists in Nigeria to utilize environmental education and appropriate guidance approaches to mitigate the personality factors responsible for environmental problems.

**Keywords:** Big five personality traits, Secondary students, Environmental literacy, Nigeria.

## 1. INTRODUCTION

The current upsurge oft in diverse issues related to the environment especially environmental literacy might not be unconnected with subtle degrading environmental conditions. Several scholars have attributed the growing rift among Nigerian's populace culture of conservation and the natural environment to environmental illiteracy (Pergams&Zaradic, 2008). Abiolu and Okere (2012) stated that from local to national and global news lines, the information that filters down to the world's population confirmed that environmental challenges confronting the earth are real. Ijatuyi (2005) confirmed that international concerns on the declining quality of the environment, especially on issues relating to scarcity of natural resources as real. Abiolu and Okere (2012) stated the Millennium Development Goals included environment sustainability consequent on the sicknesses brought about by industrialization and other unwholesome human activities on "mother earth". These scholars defined environmental literacy as a goal of environmental education which relates to an individual's intimate knowledge of a specific ecosystem. This

definition is relevant to this study as it aims to enlighten researchers designing interventions in education that taxonomy of five broad traits (Morizot, 2004) can help describe the variations in human environmental malpractices.

Scholars like Miller (2010) affirmed that environmental literacy is the ability to recognize that individual choices affect the ecosystem, and as such human beings should engage in environmentally friendly behaviours, while Disinger and Roth (1992) interpreted environmental literacy as the capacity to perceive and interpret the relative health of the ecosystem and take decisive actions to maintain, restore and improve the health of an ecosystem. The ability of an ecosystem user to perceive and interpret the health of an ecosystem has to do with cognitive processes that are invisible to the eyes of a man which might not be unconnected with the big five personality traits. This needs an understanding of the personality traits of each inhabitants or user of the ecosystem, Caspi and Shiner (2007) stressed that these have overarching theoretical



and practical implications for understanding environmental behaviours.

In this study, the 'big five' broad traits are openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism (Costa & McCrae, 1992; 1994; Miller, 2013; Kristjansson, 2012). Personality remains one of most important studied area in educational research, openness to experience represents individual differences in intellectual curiosity, imagination, appreciation of different ideas and artistic expressions cum different socio-political values. Kristjansson (2012) further explained that open people are imaginative, adventurous and art loving, while people that scored low on this sub-scale are conforming, sensible, unimaginative, and assertive. These traits have been described as the 'real psychological structures' of an ecosystem user (McCrae, 2009; Deary, 2009). It should be noted that all these qualities or attributes are necessary or ideal for an environmentally literate person.

Another factor that may help unveil environmental literacy is extraversion. Human, Thorson and Mendes (2016) asserted that extraversion involves greater sociability, dominance, excitement seeking and positive effect, which are positively related to greater social engagement, pro-social behaviour, and social outcomes (Ozer and Benet-Martinez, 2006). Scholars (Feiler&Kleinbaum, 2015; Wilt &Revelle, 2009) outlined the main features of extraversion as sociability, outgoingness, and assertiveness with affirmation that these features underpinned social behavior majorly determined in individual's immediate environment. Consequent on the links of extraversion properties with positive social outcomes, this variable is therefore an integral key person-specific characteristic (Human, et al., 2016) that can influence environmental literacy of secondary students.

Agreeableness which research has shown to be the strongest predictor of interpersonal cooperation (Volk, Thoni&Ruigrok, 2011) from structures' of an ecosystem user (McCrae, 2009; Deary, 2009). Chi and Ho (2014) captures individuals desire to maintain interpersonal harmony and ability sympathize with others' feelings. Anand, Vidyarthi, Singh and Ryu (2014) stated that agreeable individuals are likable, kind, dependable and they are intrinsically motivated to create and maintain positive relationships in their immediate environment. The affirmation of Singh and Ryu (2015) was corroborated by Graziano, Bruce, Sheese and Tobin (2007) and Hirsh, DeYoung, Xu, and Peterson (2010) that individual differences in empathy, commercial goals and acceptance of outgroups all appear related to agreeableness. Environmental literacy is a world communal goal which requires empathy and intrinsic

motivation in order to tackle the environmental challenges of the twenty-first century.

Conscientiousness and neuroticism have been found to be significant correlated with environmental concern (Hirsh, 2010). Boyce, Wood, and Ferguson (2016) linked conscientiousness with economic outcomes, with claims that conscientious individuals not only have higher goals, but have higher levels of motivation. The claims by these scholars have implications for the current study aiming to clarify relationships between the big five factor, and the environmental literacy, especially among secondary school students. Lahey (2009) described neuroticism as a personality trait that involves experiencing negative emotions, responding with negative emotions to threat, frustration, and loss. Anagnostopoulos and Botse (2016) described neuroticists as 'worriers' who are constantly preoccupied with things that might go wrong, accompanied with strong emotional reactions of anxiety to those thoughts. Sherry, Sherry, Vincent, Stewart, Hadjistavropoulos, Doucette and Hartling (2014) proposed that neuroticism might be related to health anxiety dimensions, which has implications for the current study.

Conscientiousness and neuroticism have been associated with different factors such as internet addiction (Stavropoulos, Kuss, Griffiths&Motti-Stefanidi, 2016) and substance abuse (Alminhana&Farias, 2014; Kotov, Gamez, Schmidt, & Watson, 2010) except environmental literacy factors. It is consequent on the fore-going that this study aims to assess the relationships between conscientiousness, neuroticism, openness to experience, extraversion, and agreeableness and secondary school students environmental literacy. In this research, two important issues are systematically examined:

a. What is the combined influence of big five factors (openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism) on secondary school students' environmental literacy?

b. What is the relative influence of big five factors (openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism) on secondary school students' environmental literacy?

The objective of this study is to investigate the combined and independent effects of big five factors namely openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism on secondary school students' environmental literacy. In this study, the big five factors are: openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism.



## 2. METHODOLOGY

### Research Design

The study adopted a field survey approach in which the manifestation of the variables had occurred prior to the investigation. These variables were indeed beyond the control of the researcher (Aremu, 2004).

### Sample and Sampling Techniques

The target population consisted of all secondary school students in Ondo State, Nigeria. A multi-stage sampling was used to select respondents for the study urban schools in two local governments. Intact classes were randomly selected in each of the schools. Participants were N = 462 (243 males and 219 females) from the target population of **senior** secondary school students' attending Omolurogbo Grammar School, Baptist High School, Winners College, St. Michael's Catholic High School, Oyemekun Grammar School, C.A.C Grammar School, Community Comprehensive High School, Oroke High School, Apex Academy, St. Thomas Aquinas College, St. Louis Grammar School, Akure Secondary Commercial School and Best Time college, all in Akure and Akungba-Akoko, Ondo State, Nigeria. Two hundred and thirty seven (237) respondents were below 15 years, 200 were between 15-18 years, 24 were above 18 years, while one respondent did not disclose his or her age. Thirteen schools were randomly selected in two local governments, and only intact arm of senior secondary school II was randomly chosen in each of the schools. All the students constituted the sample for the study.

### Research Instruments

Broad personality traits, students' knowledge of environmental concept, and students' attainment of essential environmental attitude were measured with validated instruments for each of the 426 participants.

### NEO Five-Factor Inventory (Costa and McCrae, 1991)

Five areas of broad personality domains (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) were measured by NEO Five-Factor Inventory comprise 44 item designed on a 5-point Likert **format**. The NEO Five-Factor was adequately reliable ( $\alpha=.87$ ), (Aremu, 2009). Examples of items in each of the broad personality factors subscale were: Extraversion – 'I am someone who is outgoing, Sociable; I am someone tends to be quiet; Agreeableness – 'I am someone who is generally trusting, I am someone who likes to cooperate with others; Conscientiousness - 'I am someone who tend to be disorganized; I am someone who easily distracted;

Neuroticism – 'I am someone who remains calm in tense situations, I am someone who is emotionally stable, not easily upset; Openness – 'I am someone who has few artistic interests. The reliability coefficient of the instrument is 0.87.

### Secondary School Students' Environmental Attitudes Questionnaire (Mansaray and Ajiboye, 1997; Ajitoni, 2005).

Students' Environmental Attitudes Questionnaire was used to tap the students' attainment of essential environmental attitudes. The questionnaire was also adopted from Mansaray and Ajiboye (1997). It is a 20-item questionnaire which elicited responses on the development of a sense of responsibility urgency involving environmental problems and issues in the participants' school environment (Oyerinde, 2013). The reliability coefficient of the instrument using cronbach Alpha was 0.78. The Students' Environmental Questionnaire was adequately reliable ( $\alpha=.74$ ) Mansaray and Ajiboye (1997).

### Procedure

All the participants for the study responded to the two research instruments namely: NEO Five-Factor Inventory and Secondary School Students' Environmental Attitudes Questionnaire in the school selected by the researchers. The research assistants, subject teachers in the selected secondary schools participated in the distribution and collection of the instruments from the respondents.

### Data Analysis

The data was analyzed using multiple regression analysis to enable the researcher establish the relationship between the big five personality traits ((Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness) and environmental literacy (Environmental Attitude).

## 3. RESULTS

**Table 1. Summary of Regression Analysis of predicting variables on Environmental Attitude**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
1		.475	.225	.217
13.56878				

  

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	24415.743	5	4883.149	26.523	.000
Residual	83954.976		456	184.112	
Total	108370.719		461		



Table 1 shows that there is a relationship between the broad personality factors (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness) and secondary school students' environmental attitude ( $R=0.48$ ). The results of the multivariate analysis also showed study accounted for 21.7% of the total variance in students' environmental attitude. This implies that 78.30 of the total variability in participants environmental attitude was not accounted for by the linear combination of the Five independent variables was due to other factors not addressed in the current study. However, the joint influence is shown to be statistically significant ( $F_{(5,456)} = 26.52$ ;  $P < 0.05$ ). This connotes that the broad personality factors had a significant joint influence on the students' environmental attitude.

**Table 2. Relative of broad personality factors on secondary school students' environmental attitude**

Variable	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
Constant	24.564	4.531		5.421	.000
Extraversion	-.917	.174	-.264	-5.269	.000
Agreeableness	.571	.170	.181	3.366	.001
Conscientiousness	1.014	.152	.356	6.674	.000
Neuroticism	-.105	.175	-.032	-.600	.549
Openness	.212	.129	.091	1.636	.103

From the result on table II, only conscientiousness ( $t=6.67$ ;  $p < 0.05$ ), extraversion ( $t=-5.27$ ;  $p < 0.05$ ) and agreeableness ( $t=3.37$ ;  $p < 0.05$ ) had significant relative influence on environmental literacy. Other broad personality factor (neuroticism and openness) had no significant relative influence when taken singly.

#### 4. DISCUSSION

Results of this study have shown that broad personality factors (extraversion, agreeableness, conscientiousness, neuroticism and openness) are significantly associated with secondary school students' environmental attitudes. This finding strengthens earlier empirical suppositions on the influence of some broad personality factors on students' attitude (Aremu, 2009; McCrae and Costa, 1987). The result is easily understandable consequence on the fact that broad personality factors such an extraversion, agreeableness and openness have been discovered to be significant predictor of help-seeking attitudes (Atik and Yalcin, 2011). For instance, a student who is an extravert tends to not only be socially assertive but also enthusiastic, and talkative. Such students are usually energized to preserve the environment when people are around them

and when they see environmental problems evolving, they may go out all the way to speak to people. Such students are, therefore, more likely to have positive attitudes to ensure that other students are environmentally literate.

Consequent on discussion of the first research question, it becomes imperative to investigate the relative contribution of the predicting variables. The results from the question showed that of the five predictor it was extraversion ( $t=-5.269$ ,  $p < 0.05$ ), agreeableness ( $t=3.366$ ,  $p < 0.05$ ) and conscientiousness ( $t=6.674$ ,  $p < .005$ ) that has relative relationships with students environmental attitudes. From this finding, it may not be out of place to infer that extraversion, agreeableness, and conscientiousness could predict environmental attitudes of secondary school students. The relative relationship of extraversion, agreeableness and conscientiousness to students' environmental attitude gives premonitions that the three independent variables may actually moderate the impact on students' environmental attitudes. The finding about agreeableness is extensively unveiled in the works of Atik and Yalcin (2011) who reported that agreeable people are generally considerate, cooperative, friendly, helpful and positive.

These traits may be instrumental to help the possession of positive environmental attitudes by the selected students. Neither neuroticism nor openness had relative relationships with secondary school students' environmental attitudes. Researchers have discovered that neuroticism could predict adolescents' academic self-efficacy (Aremu, 2009), However, non significant relative influence of neuroticism and openness, which are components of big five factors might not be unconnected with assigning of these variables at the last entry of the regression analysis. Tabachnick and Fidell (2000) found out that being entered into the model at the last entry may have decreased the predictive ability of these variables.

#### 5. CONCLUSION AND RECOMMENDATIONS

The outcome of the study revealed that extraversion, agreeableness and openness significantly influenced environmental literacy among secondary school students but neuroticism and conscientiousness did not. Considering the importance of environmental literacy on the students' sensitivity, knowledge, skills, attitudes and values towards the school environment and the capacity to take appropriate actions to maintain, restore or improve the health of the environment therefore, teachers, environmental educationists, educational and counselling psychologists should collaborate and use appropriate guidance approaches to assist students with deviated personality traits to acquire adequate school





environmental education. This would help them to acquire a basic understanding of the school environment and its **associated** problems. This would also assist them to be sensitive to school environment and its problems. Environmental education would also help the students to acquire values and feelings of concern for the school environment and motivation for active participation in the improvement and protection of the environment. More importantly, environmental education would assist these students to acquire skills necessary for identifying and solving school environmental problems and participate actively in solving them.

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