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Psychological Determinants of Pro-Environmental Behavior among High School Students in Jakarta

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ABSTRAK

Increasing environmental problems have highlighted the need to better understand the psychological determinants of pro-environmental behavior among adolescents. This study examined the effects of environmental concern, personality, and the New Ecological Paradigm (NEP) on pro-environmental behavior among high school students in Jakarta. A quantitative survey was conducted involving 475 students from nine senior high schools selected through multistage random sampling. Data were collected using validated questionnaires and analyzed using multiple linear regression. The results indicated that the regression model was statistically significant ($R = 0.741$; $R^2 = 0.548$; $p < 0.001$), accounting for 54.8% of the variance in students' pro-environmental behavior. All three psychological variables significantly predicted pro-environmental behavior, with personality emerging as the strongest predictor ($\beta = 0.400$), followed by the New Ecological Paradigm ($\beta = 0.261$) and environmental concern ($\beta = 0.241$). These findings indicated that personality was a stronger predictor than environmental concern and ecological worldview in shaping students' pro-environmental behavior. The findings provide empirical evidence that integrating psychological development into environmental education may enhance students' pro-environmental behavior and support more effective environmental education programs.

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INTRODUCTION

Environmental problems, including climate change, biodiversity loss, air pollution, water scarcity, and ecosystem degradation, have become increasingly complex global challenges that threaten environmental sustainability and human well-being (Aqil et al., 2026; Lamanauskas & Makarskaitė-Petkevičienė, 2023; Laratmase et al., 2025; Scherer et al., 2020). Although technological innovations have improved environmental management and resource efficiency, these advances alone are insufficient to address environmental degradation without corresponding changes in human behavior. Numerous studies have emphasized that pro-environmental behavior is one of the most effective approaches to mitigating environmental problems because environmental degradation is primarily driven by unsustainable human activities rather than technological limitations (Frumkin, 2022; Maduku, 2024; Wongsonadi et al., 2026). Promoting pro-environmental behavior has become a central objective of environmental education and sustainable development initiatives worldwide. Consequently, understanding the psychological factors that encourage individuals to engage in pro-environmental behavior has become an important research agenda in environmental psychology and environmental education (Baga et al., 2024; Rahmania, 2024).

Indonesia, particularly the Special Capital Region of Jakarta, faces serious environmental challenges. According to the Environmental Quality Index (Indeks Kualitas Lingkungan Hidup/IKLH), Jakarta recorded one of the lowest environmental quality scores in Indonesia, especially in air quality and land cover indicators, highlighting the urgent need to strengthen environmentally responsible behavior among its citizens. Adolescents constitute a strategic population because they will inherit future environmental problems while simultaneously developing behavioral patterns that often persist into adulthood. Schools therefore play a critical role not only in improving students' environmental knowledge but also in fostering psychological characteristics that encourage consistent pro-environmental behavior. However, despite extensive implementation of environmental education programs, students' pro-environmental behavior remains inconsistent, indicating that increasing environmental knowledge alone may not be sufficient to promote sustainable behavioral change.

Previous studies have identified various psychological determinants of pro-environmental behavior. Environmental concern has consistently been associated with stronger environmental responsibility because individuals who care more about environmental issues are more likely to engage in environmentally responsible actions (Cruz & Manata, 2020; Gómez-Carmona et al., 2022; Vondra et al., 2025). Likewise, the New Ecological Paradigm (NEP), which represents individuals' ecological worldview, has been reported as an important predictor of pro-environmental behavior (Dunlap & Jone, 2002; Gansser & Reich, 2023; Praminingsih et al., 2021). More recently, personality traits, particularly those described by the Big Five framework, have attracted increasing attention because stable psychological characteristics influence individuals' behavioral choices across different environmental contexts (Halkos et al., 2024; Nguyen, 2025). Despite these advances, previous findings remain fragmented and provide limited guidance for determining which psychological factor should become the primary focus of environmental education.

Collectively, environmental concern, personality, and the New Ecological Paradigm represent three complementary psychological dimensions underlying pro-environmental behavior. Environmental concern reflects affective responses toward environmental issues, the New Ecological Paradigm represents ecological beliefs and values, whereas personality reflects relatively stable individual characteristics that influence behavioral tendencies. Examining these dimensions simultaneously provides a more comprehensive understanding of pro-environmental behavior than investigating each construct independently.

Although these psychological variables have been widely investigated, previous findings remain inconsistent regarding their relative influence on pro-environmental behavior. Some studies reported environmental concern as the strongest predictor, whereas others emphasized ecological worldview or personality traits. These inconsistencies suggest that the mechanisms underlying pro-environmental behavior may differ across educational, cultural, and demographic contexts.

Three major research gaps can be identified from the existing literature. First, previous studies have predominantly examined environmental concern, personality, and the New Ecological Paradigm as separate predictors, whereas relatively few studies have evaluated their simultaneous contribution within a single regression model. Consequently, although each variable has been shown to influence pro-environmental behavior, their relative predictive strength remains unclear. It is therefore difficult to determine which psychological characteristic should receive greater emphasis in educational interventions. Second, most empirical evidence has been generated from Western countries or adult populations, whereas studies involving adolescents in developing countries remain limited. Considering that socio-cultural contexts influence psychological processes and environmental behavior, evidence obtained from developed countries cannot be directly generalized to Indonesian high school students. Third, environmental education programs implemented in Indonesian schools generally emphasize increasing environmental knowledge and awareness. However, these programs are rarely supported by empirical evidence identifying which psychological characteristics most strongly predict students' pro-environmental behavior, making it difficult to develop evidence-based intervention strategies.

This study was designed to address these gaps by simultaneously examining environmental concern, personality, and the New Ecological Paradigm as psychological determinants of pro-environmental behavior among high school students in Jakarta using multiple linear regression analysis. Rather than merely testing whether these variables significantly influence behavior, this study evaluates their relative predictive contributions within a unified analytical framework, enabling the identification of the strongest psychological predictor after controlling for the effects of the other variables.

The novelty of this study lies not simply in integrating three psychological variables into a single model, but in identifying the dominant psychological determinant of pro-environmental behavior among Indonesian high school students. While previous studies have largely focused on establishing significant relationships between individual psychological variables and pro-environmental behavior, this study provides empirical evidence regarding the relative importance of each predictor. Such evidence is essential because educational resources are

inherently limited, requiring schools to prioritize intervention strategies that target the psychological characteristics with the greatest potential to produce sustainable behavioral change.

This study contributes to the literature in three important ways. First, it provides a comparative evaluation of environmental concern, personality, and the New Ecological Paradigm within a unified predictive model rather than examining each variable independently. Second, it extends empirical evidence on the psychological determinants of pro-environmental behavior to Indonesian adolescents, a population that remains underrepresented in previous research despite its strategic importance for environmental education. Third, the findings provide evidence-based recommendations for designing school environmental education programs by identifying the psychological characteristic that should receive greater emphasis in fostering pro-environmental behavior among students.

Therefore, this study aims to examine the effects of environmental concern, personality, and the New Ecological Paradigm on pro-environmental behavior among high school students in Jakarta and to determine which psychological factor serves as the strongest predictor of students' pro-environmental behavior.

METHODS

Type of Research

This study employed a quantitative survey design with a causal approach to examine the psychological determinants of pro-environmental behavior among high school students in Jakarta. Specifically, the study investigated the effects of environmental concern, personality, and the New Ecological Paradigm (NEP) on students' pro-environmental behavior using multiple linear regression analysis.

Time and Place of Research

The research was conducted from 20 August to 25 September 2025 in nine senior high schools located in Jakarta, Indonesia. The study included instrument review, pilot testing, questionnaire revision, data collection, and quantitative data analysis.

Population and Sample

The target population comprised senior high school students enrolled in Grades 10–12 in Jakarta. The accessible population consisted of students attending schools that had implemented environmental programs for at least two consecutive years. Participants were selected using multistage random sampling**.** First, four administrative cities in Jakarta were selected as the research areas. Second, nine public and private senior high schools with established environmental programs were selected through cluster sampling based on predetermined criteria. Finally, respondents were selected using simple random sampling. Based on the sample size calculation, 475 students participated in this study.

Research procedure

The study was conducted in several stages. Initially, the research instruments were reviewed, pilot-tested, and revised to ensure their validity and reliability. Subsequently, questionnaires were administered to students in the selected schools. After the questionnaires were completed, the data

were checked, coded, and entered into IBM SPSS Statistics version 26 for statistical analysis. The analysis focused on examining the predictive effects of environmental concern, personality, and the New Ecological Paradigm on students' pro-environmental behavior.

Data, Instruments, and Data Collection Techniques

Primary data were collected using structured questionnaires measuring four research variables: environmental concern, personality, the New Ecological Paradigm (NEP), and pro-environmental behavior. The questionnaires were administered directly to the selected respondents. Prior to data collection, all research instruments underwent validity and reliability testing to ensure their suitability for measuring the intended constructs.

Data Analysis Technique

The data were analyzed using IBM SPSS Statistics version 26**.** Descriptive statistics were first employed to summarize the characteristics of each research variable, including the mean, median, mode, variance, standard deviation, and frequency distribution. Before hypothesis testing, assumption tests consisting of normality, homogeneity, and linearity were conducted.

The hypotheses were tested using multiple linear regression analysis to examine the effects of environmental concern, personality, and the New Ecological Paradigm on pro-environmental behavior. The standardized regression coefficients (β) were used to compare the relative contribution of each psychological determinant in predicting students' pro-environmental behavior. Statistical significance was determined at the 0.05 level.

RESULTS AND DISCUSSION

To provide an initial overview of the dataset, descriptive statistics were calculated for the psychological determinants and pro-environmental behavior variables. This preliminary analysis summarizes the distribution of respondents' scores and provides a general profile of students' psychological characteristics before examining the predictive relationships among the variables. The descriptive statistics, including the number of respondents, minimum and maximum scores, mean, and standard deviation, are presented in Table 1.

Table 1. Descriptive Statistics of the Research Variables

Variable	N	Minimum	Maximum	Mean	SD
Environmental Concern	475	9	24	18.32	3.11
Personality	475	46	80	66.71	7.46
New Ecological Paradigm (NEP)	475	17	36	31.33	3.58
Pro-Environmental Behavior	475	18	48	39.29	6.00

Table 1 shows that the study involved 475 high school students from nine schools in Jakarta. Overall, the respondents demonstrated relatively positive scores across the three psychological determinants examined. Personality exhibited the highest average score (M = 66.71, SD = 7.46), followed by the New Ecological Paradigm (M = 31.33, SD = 3.58) and environmental concern (M = 18.32, SD = 3.11). The average score for pro-environmental behavior was 39.29 (SD = 6.00), indicating that environmentally responsible behaviors were generally reported among the

participating students. Moreover, the relatively moderate standard deviation values suggest that respondents' scores were reasonably consistent across all variables, providing a suitable basis for subsequent inferential analysis using multiple linear regression.

Prior to multiple linear regression analysis, the underlying statistical assumptions were examined to ensure that the data were suitable for hypothesis testing. The assumptions evaluated included normality, homoscedasticity, and multicollinearity. The results indicated that all assumptions required for multiple linear regression were satisfied, supporting the use of the proposed regression model.

The normality of the regression residuals was assessed using the Shapiro–Wilk test. As presented in Table 2, the residuals were normally distributed (Shapiro–Wilk = 0.995, p = 0.161). The Kolmogorov–Smirnov test also produced a non-significant result (p = 0.200), confirming that the residuals met the normality assumption.

Table 2. Normality Test of Regression Residuals

Test	Statistic	df	Sig.
Kolmogorov–Smirnov	0.026	475	0.200
Shapiro–Wilk	0.995	475	0.161

The homoscedasticity assumption was evaluated using a scatterplot of standardized residuals. The residuals were randomly dispersed around the zero line without forming any discernible pattern, indicating constant error variance across the predicted values. Therefore, the regression model satisfied the assumption of homoscedasticity.

The multicollinearity test further demonstrated that the independent variables were statistically independent. As shown in Table 3, all tolerance values exceeded 0.10, while the Variance Inflation Factor (VIF) values ranged from 1.319 to 1.756, well below the recommended threshold of 10. These results indicate that multicollinearity was not present, confirming that environmental concern, personality, and the New Ecological Paradigm could be included simultaneously in the multiple regression model.

Table 3. Multicollinearity Statistics

Variable	Tolerance	VIF
Environmental Concern	0.758	1.319
Personality	0.569	1.756
New Ecological Paradigm	0.640	1.562

Following the confirmation that the regression assumptions were satisfied, multiple linear regression analysis was performed to examine the extent to which environmental concern, personality, and the New Ecological Paradigm (NEP) predicted pro-environmental behavior among high school students in Jakarta. The analysis evaluated the overall explanatory power of the regression model, its statistical significance, and the relative contribution of each psychological determinant.

Table 4. Model Summary of Multiple Linear Regression Analysis

Model	R	R^2	Adjusted R^2	Durbin–Watson
1	0.741	0.548	0.546	1.857

The regression model demonstrated a strong association between the three psychological determinants and pro-environmental behavior (R = 0.741). The coefficient of determination (R^2 = 0.548) indicated that 54.8% of the variance in students' pro-environmental behavior could be explained jointly by environmental concern, personality, and the New Ecological Paradigm. The remaining 45.2% of the variance may be attributed to other factors not included in the present model. Furthermore, the small difference between the R^2 and adjusted R^2 values suggests that the model was stable and possessed satisfactory explanatory power. The Durbin–Watson statistic (1.857) was close to the expected value of 2.0, indicating no evidence of autocorrelation among the residuals. The overall significance of the regression model was subsequently evaluated using analysis of variance (ANOVA), as presented in Table 5.

Table 5. Analysis of Variance (ANOVA)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	9356.119	3	3118.706	190.695	<0.001
Residual	7702.942	471	16.354		
Total	17059.061	474			

The ANOVA results confirmed that the regression model was statistically significant (F = 190.695, $p < 0.001$), indicating that the combination of environmental concern, personality, and the New Ecological Paradigm significantly predicted students' pro-environmental behavior. These findings demonstrate that the proposed model provides a reliable framework for explaining pro-environmental behavior among high school students in Jakarta.

To determine the relative contribution of each psychological determinant, the standardized regression coefficients were examined. The results are presented in Table 6.

Table 6. Regression Coefficients

Predictor	B	SE	β	t	Sig.
Constant	-4.364	1.867	—	-2.338	0.020
Environmental Concern	0.464	0.069	0.241	6.767	<0.001
Personality	0.321	0.033	0.400	9.742	<0.001
New Ecological Paradigm	0.437	0.065	0.261	6.753	<0.001

The regression analysis revealed that all three psychological variables significantly and positively predicted pro-environmental behavior ($p < 0.001$). Students with higher levels of environmental concern, more favorable personality characteristics, and stronger ecological worldviews tended to report higher levels of pro-environmental behavior.

Among the three predictors, personality emerged as the strongest psychological determinant, as indicated by the highest standardized regression coefficient (β = 0.400). This was followed by the New Ecological Paradigm (β = 0.261) and environmental concern (β = 0.241). These findings indicate that although all three psychological factors contribute significantly to students' pro-environmental behavior, personality exerts the greatest relative influence after controlling for the effects of the other variables. Consequently, personality appears to play a more prominent role than environmental concern

and ecological worldview in shaping environmentally responsible behavior among high school students in Jakarta.

The present study examined the relative contribution of three psychological determinants—environmental concern, personality, and the New Ecological Paradigm (NEP)—to pro-environmental behavior among high school students in Jakarta. The multiple regression analysis demonstrated that the proposed model explained 54.8% of the variance in students' pro-environmental behavior, indicating that psychological factors play a substantial role in shaping environmentally responsible actions among adolescents. More importantly, although all three variables significantly predicted pro-environmental behavior, personality emerged as the strongest predictor, followed by the New Ecological Paradigm and environmental concern.

The finding that personality exhibited the largest standardized regression coefficient ($\beta = 0.400$) suggests that relatively stable individual characteristics exert a stronger influence on students' environmental behavior than environmental concern or ecological worldview alone. Personality influences how individuals regulate emotions, develop self-discipline, assume responsibility, and maintain behavioral consistency across different situations. Consequently, students possessing personality characteristics such as conscientiousness, agreeableness, and openness to experience are more likely to perform environmentally responsible behaviors consistently, even when external supervision or environmental campaigns are absent. This finding is consistent with previous studies reporting that personality traits constitute stable psychological foundations underlying sustainable behavior (Halkos et al., 2024; Nguyen, 2025). Unlike situational attitudes that may fluctuate according to circumstances, personality represents enduring behavioral tendencies that guide individuals' everyday decisions, making it a particularly influential determinant of pro-environmental behavior.

The New Ecological Paradigm (NEP) was identified as the second strongest predictor ($\beta = 0.261$), indicating that students' ecological worldview also plays an important role in promoting pro-environmental behavior. The NEP reflects individuals' beliefs regarding the interdependence between humans and nature, emphasizing ecological limits and environmental sustainability (Dunlap et al., 2000). Students who possess stronger ecological beliefs are more likely to perceive environmental protection as a personal responsibility, thereby encouraging behaviors such as conserving resources, reducing waste, and participating in environmental activities. Nevertheless, the smaller standardized coefficient compared with personality suggests that ecological beliefs alone may not always translate into consistent environmental actions. Behavioral implementation often depends on broader psychological characteristics that enable individuals to transform environmental values into habitual practices.

Environmental concern also showed a significant positive relationship with pro-environmental behavior ($\beta = 0.241$). This finding supports previous research demonstrating that individuals who express greater concern about environmental problems tend to engage more frequently in environmentally responsible behaviors (Cruz & Manata, 2020; Gómez-Carmona et al., 2022). However, environmental concern contributed less strongly than personality and ecological worldview. This result indicates that emotional concern regarding environmental issues does not necessarily lead to behavioral change unless supported by stable personal characteristics and ecological beliefs. Students may recognize environmental problems and express concern about them, yet such concern may remain at the level of awareness rather than being translated into consistent daily behavior.

Collectively, these findings provide important implications for environmental education. Environmental education programs in Indonesian schools have traditionally emphasized increasing environmental knowledge and awareness through classroom instruction and environmental campaigns (Aqil et al., 2023; Baga et al., 2024). While such approaches remain important, the present findings suggest that strengthening environmental concern alone may not be sufficient to promote long-term behavioral change (Daikoban et al., 2019; Shafiei & Maleksaeidi, 2020; Sreen et al., 2021). Instead, educational programs should integrate psychological development into environmental learning by fostering personality characteristics associated with responsibility, self-discipline, cooperation, and openness toward environmental issues. Learning activities emphasizing collaborative problem solving, reflective learning, environmental leadership, and active participation in school-based sustainability programs may contribute not only to improving environmental knowledge but also to strengthening the psychological characteristics that support pro-environmental behavior (Angelita et al., 2023; Burgos-Espinoza et al., 2024; Net et al., 2024).

Theoretically, this study extends the literature by providing comparative evidence regarding the relative contribution of three major psychological determinants within a single predictive model among Indonesian adolescents. Whereas previous studies have often examined environmental concern, ecological worldview, or personality independently, the present findings demonstrate that these psychological constructs contribute differently when analyzed simultaneously. The identification of personality as the strongest predictor contributes to a more comprehensive understanding of adolescent pro-environmental behavior and highlights the importance of integrating psychological perspectives into environmental education research (Lisboa et al., 2024; Pelcher et al., 2024; Reaños et al., 2023; Wetering et al., 2022).

Overall, the findings indicate that pro-environmental behavior among high school students is influenced by multiple psychological factors rather than by environmental awareness alone. Among these factors, personality represents the most influential determinant, followed by ecological worldview and environmental concern. These results emphasize that fostering sustainable behavior requires educational approaches that address not only students' environmental knowledge and attitudes but also the development of enduring psychological characteristics that encourage environmentally responsible behavior.

CONCLUSION

This study demonstrates that psychological factors play a substantial role in explaining pro-environmental behavior among high school students in Jakarta. Environmental concern, personality, and the New Ecological Paradigm (NEP) collectively provided significant predictive power for students' pro-environmental behavior. Among these psychological determinants, personality emerged as the strongest predictor, followed by the New Ecological Paradigm and environmental concern. These findings indicate that environmentally responsible behavior is influenced not only by students' awareness of environmental issues or ecological beliefs but also by relatively stable personal characteristics that shape consistent behavioral tendencies. The study therefore extends current understanding of the psychological determinants of pro-environmental behavior among Indonesian adolescents and highlights the importance of integrating psychological development into

environmental education to promote more sustainable behavioral change.

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