

Personality Traits and Aggressive Behavior in Vietnamese Adolescents

Duc Tin Le¹, Son Van Huynh¹, Truong Vuong Vu², Nhu-Thuyen Dang-Thi¹, Bao-Tran Nguyen-Duong¹, Kiet Anh Duong¹, Tan Ngan Mai¹, Thanh Nhon Huynh¹, Phuc Tan Mai¹, Vinh-Long Tran-Chi^{1,3}

¹Faculty of Psychology, Ho Chi Minh City University of Education, Ho Chi Minh City, Vietnam; ²Faculty of Education, Ha Long University, Ha Long City, Vietnam; ³Scientific Management Department, Dong A University, Da Nang City, Vietnam

Correspondence: Truong Vuong Vu, Faculty of Education, Ha Long University, Ha Long City, Quang Ninh Province, 200000, Vietnam, Tel +84 203 385 2174, Fax +84 203 362 3775, Email vuongtruong@daihochalong.edu.vn

Purpose: This study aims to reveal the relationship between personality characteristics and verbal or physical aggression in Vietnamese adolescents.

Patients and Methods: We recruited 3003 participants [1498 boys (49.9%) and 1505 girls (50.1%); mean age \pm SD = 13.50 \pm 0.936] who we tested with the Eysenck Personality Questionnaire - Brief version (EPQ-BV), and Vietnamese Aggression Scale (VAS). A multivariate analysis of variance test, Pearson Correlation, and analyzing mediating variable interaction is used to analyze data.

Results: The findings suggested a significant interaction between personality traits, specifically extraversion and neuroticism, and physical aggression, verbal aggression, and anger. Students with higher levels of personality had higher levels of verbal aggression, and students with higher levels of physical aggression and anger had stronger personality traits than others and lower levels of physical aggression and anger. Personality traits, specifically extraversion, and neuroticism, differed significantly by gender and school years in adolescence. Mediation analysis revealed a positive and statistically significant indirect correlation between personality traits and physically aggressive behavior, with anger as a mediator. Similarly, a positive and statistically significant indirect correlation between personality traits and verbally aggressive behavior through anger was found. The relationship between personality traits and physical aggression was also significant via verbal aggression and anger.

Conclusion: This study improved our understanding of personality traits and verbal or physical aggression. Most crucially, physical and verbal aggression mediate personality traits and aggressive conduct. In secondary school, gender and school year affected extraversion and neuroticism. This discovery illuminates personality-based aggressiveness intervention.

Keywords: adolescent, personality, aggressive behavior, physical aggression, verbal aggression

Introduction

Adolescence has been recognized as a phase of rapid physiological and psychological changes in human development. Because of these transformations, adolescents face a variety of crises and predicaments that may affect their mental and emotional states. At this stage, they suffer much ambiguity and disappointment with the process of creating their self-images and other forms of development, which promotes the growth of aggression.¹ Moreover, this developmental stage is characterized by impulsivity-related trials and sensation-seeking.² The youths' aggression also connects with a series of individual, academic, family, and social factors.³ It has been shown that adolescents, particularly those in secondary schools, engage in many aggressive behaviors that negatively affect their psychological, social, and academic development.⁴

Aggressive Behavior

Aggressive behavior is the outward manifestation of aggression, defined as any behaviors designed to inflict hurt, pain, or injury on another.⁵ Aggressive behavior may be viewed as a deficiency in social skills or a maladaptive approach to resolving social issues. It may be analyzed in terms of aggressively biased cognitive processing or aggressive scripts.

Aggressive behaviors are classified into direct aggressiveness and indirect ones. Additionally, those behaviors can also be categorized into overt and rational, which accords to the manner employed to inflict injury by distinguishing between forms. Besides, those could be divided regarding the function of the behaviors (reactive aggression or proactive aggression).⁶

Moreover, according to the object of aggressiveness, aggressive behaviors are also classified into physical and social. Physical aggressiveness covers behaviors that threaten or cause physical damage, such as bodily harm threats, physical altercations, and violent crimes, such as robbery, rape, and murder.^{7,8} Social aggression encompasses non-physical types of aggressiveness, such as indirect and relational aggression, in which the focus is on harming social relationships rather than causing or threatening bodily damage.⁹ Those behaviors could be gossiping, isolating, or alienating someone (12) socially. It has been shown that aggression is a stable personality feature that persists from childhood through maturity.⁷

Aggressive Behavior in Adolescent

The research found certain predictors of aggression in adolescents. Aggressive adolescents' sense hostile circumstances, analyze a few facts, and choose incorrect and aggressive objectives.^{10,11} Firstly, childhood hostility was the most significant predictor of grown-up long-term unemployment, with its many psychological and social repercussions, including crime.¹² Secondly, personality traits are important determinants of aggressive behavior among teenagers in secondary school.¹³ Those who manifest more conscientiousness experience less victimization, healthier friendships, more careful consideration, self-discipline, and greater peer acceptability.¹⁴ All those consequences seem to stem the tendency to form aggressive behaviors.

Conscientiousness is a personality trait associated with a person's tenacity, control, organization, responsibility, orderliness, dependability, and drive to attain goals,^{15,16} and it is typically correlated adversely with aggressiveness.¹⁷ In general, a conscientious adolescent will exhibit less aggressive behavior, whereas those with poorer conscientiousness are more prone to engage in social aggressiveness.¹⁸ In parallel with that, a substantial positive correlation exists between conscientiousness and aggression among teenagers in school.⁴

Factors Affect Aggressive Behavior

In addition, other factors have effects on aggression among the youths. Men are more likely than women to engage in direct aggressive behavior.^{19,20} Individual values are stronger in aggressors than they are in victims. Social values are more significant to aggressors than victims.²¹

In children, the greatest significant statistical difference was discovered in the capacity to identify constructive alternatives.²² Children were not permitted to behave angrily, but no one suggested alternatives.²³

In older ages, aggressive students consistently utilized aggressive methods in various social circumstances and at each level of problem-solving. Consequently, aggressive pupils adopted aggressive strategies regardless of the situation's provocation.²²

One of the most important factors that can help predict aggressive and violent behavior is a person's gender.²⁴ An association between gender and aggressive behavior has been shown in numerous earlier studies.^{25,26} In fact, until the 1990s, it was generally believed that childhood aggressiveness was a male phenomenon.²⁷ Theories and studies were either produced based mostly on samples from males²⁸⁻³¹ or without considering gender.³² Since 1990, researchers have shown a significant increase in interest in the antisocial conduct of girls.²⁷ Studies have shown gender disparities in aggressive behavior between men and women.^{33,34} Most research demonstrated that male is more aggressive than female.³⁵⁻³⁸ Physical aggressiveness is often the two forms of aggression conducted most frequently seen in men.^{39,40} Men are often more aggressive than women, and the level of aggression that they display does not lessen even after they have caused injury to their target.⁴¹ Women are more likely than men to engage in indirect forms of aggression (eg, gossiping, defamation) through behaviors that lack the intention to cause harm, injury, or a loss of self-control over other forms of aggression.⁴²⁻⁴⁴ To explain this, evolutionary theory predicts that women avoid physical violence due to the higher danger of injury, which could negatively impact their reproductive success.⁴⁵ Although men were more aggressive than women, sex differences were inconsistent among research.⁴⁶ Significant correlations were found between the sex differences and several study characteristics, including developmental stages, types of confrontation,

aggression styles, gender of the victims, causes, attitudes toward violence, and perceived consequences of aggression.^{24,46} Burbank⁴⁷ discovered that most of the women's aggressiveness is indirect and rarely resulted in physical harm. Therefore, aggression is more prevalent among women and girls.⁴⁴ Several studies have yielded results that contradict the findings of most previous studies, which suggested that men are more aggressive than women.^{48–50} In addition, some reports indicated that there was no significant difference between male and female aggressiveness in certain situations.^{51–53} According to Frodi, Macaulay, and Thome,⁵⁴ women may behave aggressively on par with men when aggressiveness is viewed as justified or prosocial and when these other elements are under control. Particularly when exposed to both violent indications and aversive provocation, men and women behave aggressively in the same ways.⁵¹ Studies on kids have revealed similarities between boys' and girls' aggressive behaviors, including aggressive patterns, violent attitudes, and aggressive circumstances.^{55–57} Boys and girls who were aggressive tended to be rejected more by their peers of the same gender than by the other gender.⁵⁸ According to Shaban and Kumar⁵³ the pattern of aggressive behavior is shifting in current times since men and women display practically the same degrees of aggressive behavior.

Aggression is a well-studied topic in psychosocial literature, particularly developmental theories of aggression in adolescents and adults' aggression and violence, or ages 59–62. According to Clow,⁵⁹ the age of onset is also a significant element in determining the nature and type of aggression. Aggressive behavior throughout childhood is viewed as an aspect of the natural development of children.⁶⁰ During the first few years of life, infants develop the ability to use force against other people, which progressively develops into intentional violence as they get older.⁶¹ After a certain amount of time has passed for growth, aggressive behaviors will eventually stop escalating at a certain point in time and become less common as the individual gets older.⁶² However, the period when aggressive behavior peaks, as observed in research, is not constant because it relies on a variety of other variables, including the type of aggression, the study's subject, and gender.⁶³ Fite, Colder, Lochman and Wells⁶⁴ suggested that levels of both proactive and reactive aggression peaked in the 6th grade and declined thereafter. Along with the assertions, numerous studies have also supported the idea that aggressive conduct peaks and is widespread in adolescence.^{56,65–67} According to Tapper and Boulton⁶⁸ finding, children aged 10 to 11 held stronger instrumental representations of all three types of aggressiveness (physical, verbal, and indirect aggression) than children aged 7 to 8 years. Physical aggression peaked at the age of 15, whereas social aggression peaked around the age of 14.⁵⁶

The interaction between personality traits and aggressive behaviors has drawn the attention of plenty of scholars and researchers. However, according to our knowledge, no prior research has been studied on this relationship in secondary students. In light of that research gap, we conducted this study to investigate new discoveries in the field. The main objectives of this paper are to discover the relationship between personality traits and aggressive behaviors among secondary students.

Materials and Methods

Research Hypothesis

This study used a cross-sectional study to investigate predictors of Marital Intention among emerging adults in Vietnam.

Hypothesis 1: There is no significant difference between gender in the Personality traits.

Hypothesis 2: There is no significant difference among the three study groups of different grades when they are compared on the Personality traits.

Hypothesis 3: There is no significant interaction between gender and grade level when participants are compared on the Personality traits.

Hypothesis 4: Anger would mediate the relationship between Personality traits and Physical aggression among Vietnamese adolescents.

Hypothesis 5: Anger would mediate the relationship between Personality traits and Verbal aggression among Vietnamese adolescents.

Hypothesis 6: Verbal aggression and Anger would mediate the relationship between Personality traits and Aggressive behavior among Vietnamese adolescents.

Procedure

Prior to enrollment, informed consent was obtained from all subjects, which included information on their right to withdraw from the study. The participants were also informed about the purpose of the research and were requested to provide their information through self-report questionnaires. The questionnaires were completed by the participants under the guidance and supervision of research instructors. The data collection process took place over a period of three weeks, starting in March 2021 and ending in July 2021, which coincided with the first wave of the COVID-19 pandemic. The research was conducted with the necessary permissions obtained for the data collection process.

To ensure accurate translation, the Eysenck's Personality Questionnaire – Brief Version (EPQ-BV), which comprised 24 items, was translated following the translation and back-translation process guidelines. Since this scale has been widely used in the public domain, the authors did not require any additional permission to use it. To aid the translation process, a Vietnamese native speaker, who was proficient in English and experienced in translating exercises, was recruited.

The initial translation of the scale was generated by a Vietnamese translator, which was then reconciled by all research members to create an appropriate final translation for back-translation. A native English speaker, who was also proficient in Vietnamese, performed the back-translation from Vietnamese to English. After receiving the back-translation, the research group compared it with the original scale to identify any contradictions or discrepancies. Following the assessment, no issues were detected, and the final Vietnamese version of the EPQ-BV was accepted for use.

Participants

In order to gather participants for the study, researchers recruited volunteers from multiple secondary schools located in ten provinces throughout Vietnam. Convenience sampling was adopted, and sample size was estimated using the metric of 20 participants per item in the questionnaire survey.⁶⁹ The instrument with the items was the 35-item from two scales. Thus, the estimated sample size was 700 participants. Providing sample loss, we enlarged the estimated sample size by 20% and the final sample size estimation was 840 participants.⁶⁹ A total of 3228 questionnaire surveys were distributed among the potential participants. After analyzing the responses, 225 surveys were excluded from the dataset due to incomplete information or because the same answer was provided for all questions, leaving a final sample of 3003 participants. The final sample consisted of a diverse group of students with 529 (17.6%) self-identified as sixth-graders, 987 (32.9%) as seventh-graders, 1083 (36.1%) as eighth graders, and 404 (13.5%) as ninth graders. Descriptive statistics of the participants, including their age and gender, were analyzed and the impact of these demographic characteristics on personality traits and aggressive behaviors was explored. These findings are presented in detail in Table 1. Overall, this study collected a substantial amount of data from a diverse group of students in Vietnam and provides valuable insights into the relationship between demographic characteristics, personality traits, and aggressive behaviors. STROBE guidelines for cross-sectional research were used in this study.⁷⁰

Ethical Aspects

The studies involving human participants were reviewed and approved by the Declaration of Helsinki and the ethical principles of the American Psychological Association (APA) regarding research involving human participants. The study was approved by the Ethic Committee of the Department of Science and Technology - Ho Chi Minh City University of Education (under the Vietnamese MoET) with number 3438/QD-DHSP on December 14, 2020. We obtain consent from adolescents to participate through their school guardians, who are teachers, with permission from school leadership.

Table I Sample Descriptive Characteristics

		E	N	P	VA	PA	AG	AB	A
Grade	n (%)	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*
Grade 6	529 (17.6)	2.65±.910	2.38±1.203	2.52±.820	0.98±1.000	1.01±1.222	2.07±1.739	0.99±.991	1.19±.976
Grade 7	987 (32.9)	2.73±.923	2.68±1.216	2.70±.807	1.42±1.260	1.30±1.351	2.34±1.825	1.37±1.181	1.54±1.146
Grade 8	1083 (36.1)	2.76±.966	2.77± 1.180	2.76±.785	1.34±1.200	1.21±1.284	2.42±1.851	1.29±1.125	1.49±1.109
Grade 9	404 (13.5)	2.82±.951	2.85±1.157	2.84±.739	1.46±1.282	1.20±1.369	2.34±1.845	1.35±1.223	1.53±1.173
Gender	n (%)	M±SD	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*	M±SD*	M±SD
Boy	1498 (49.9)	2.72±.944	2.38±1.135	2.55±.780	1.45±1.243	1.31±1.334	1.91±1.660	1.39±1.168	1.48±1.131
Girl	1505 (50.1)	2.76±.938	2.99±1.188	2.87±.784	1.19±1.162	1.10±1.279	2.73 ± 1.889	1.15±1.105	1.44±1.099

Note: *p<0.05.

Abbreviations: M, Mean; SD, Standard deviation; n, number of participants; P, Personality traits; E, Extraversion; N, Neuroticism; AG, Anger; AB, Aggressive behavior; PA, Physical aggression; VA, Verbal aggression.

Measurement

Eysenck Personality Questionnaire - Brief Version

The Eysenck's Personality Questionnaire – Brief Version (EPQ-BV; Toru, 2005) was used to assess two dimensions of personality: extraversion (12 items, such as “Are you a talkative person?” or “Are you rather lively?”) and neuroticism (12 items, such as “Do you ever feel miserable for no reason?”, or “Do you worry too long after an embarrassing experience?”). The questionnaire was graded on a seven-point Likert scale, with the lowest score being 1 (not at all) and the highest being 5 (to extremely). The total scale had a good Cronbach's Alpha score ($\alpha=0.803$). The total scale had a good Cronbach's Alpha score ($\alpha=0.804$), which indicates that it was well-designed. A good value of $\alpha=0.731$ and $\alpha=0.868$ was obtained for Cronbach's Alpha of two subscales: Extraversion and Neuroticism. These results demonstrate the validity of the scales as a whole in terms of content and that the observed variables agree with one another as far as clarifying the content of the scale is concerned.

A Vietnamese Version of the Aggression Scale

The Vietnamese Aggression Scale (VAS) was used to assess general aggressive behaviors regarding physical aggression (4 items, such as “I slapped or kicked someone” or “I threatened to hurt or to hit someone”), verbal aggression (5 items, such as “I said things about other kids to make other students laugh”, or “I encouraged other students to fight”) and anger (2 items, such as ‘I got angry very easily with someone,’ or ‘I was angry most of the day’ in the last seven days.⁷¹ The physical aggression subscale includes items related to physical violence, while the verbal aggression subscale includes items related to verbal aggression, such as insulting and threatening behavior. The questionnaire was scored on a seven-point Likert scale ranging from 0 (0 times) to 6 (6 or more times). A reliable and relevant measure of violent behavior in Vietnamese adolescents is the Vietnamese Aggression Scale.⁷¹ The VAS was developed and validated in a study conducted in Vietnam and has been found to have good reliability and validity. The scale has been used in various studies to investigate the prevalence of aggressive behavior among Vietnamese adolescents and its association with various factors such as personality traits, family environment, and social factors. Overall, the VAS is a useful tool for researchers and practitioners working in the field of adolescent aggression in Vietnam, providing a reliable and valid measure of both physical and verbal aggression.

Research Analysis

The data cleansing and coding process were done in Excel. Descriptive and inferential statistical analyzes were performed using SPSS software version 26 to test hypotheses 1, 2, and 3. Besides, to evaluate the mediating role in the relationships under hypotheses 4, 5, and 6, we applied model four of Hayes's⁷² to consider the statistical significance of the proposed models.

Results

Descriptive Analysis

To examine the internal consistency of Eysenck's Personality Questionnaire – Brief Version (EPQ-BV)⁷³ and The Vietnamese Aggression Scale (VAS),⁷¹ Cronbach's Alpha (CA) was used by the authors.⁷⁴ With the EPQ-BV, the value of Cronbach's Alpha for the Extraversion (E) subscale was 0.731, and Neuroticism (N) subscale was 0.868. With the VAS, the CA value of the Verbal Aggression (VA) subscale was 0.669, the Physical Aggression (PA) subscale was 0.727, and Anger (AG) subscale was 0.651. According to Hair, et al⁶⁹ and Taber⁷⁵ the value of Cronbach's Alpha should be higher than 0.70 to assure the scale's reliability, the value of each subscale below 0.70 are still acceptable. Consequently, the variables in this research were deemed reliable.

The ANOVA results showed statistically significant differences by school year in personality traits and aggressive behavior. Adolescents in 9th grade show high scores on three scales Extraversion (2.82 ± 0.951), Neuroticism (2.85 ± 1.157), Personality (2.84 ± 0.739), and Verbal aggression (1.46 ± 1.282). Meanwhile, adolescents in 6th grade showed the lowest scores on the Extraversion (2.65 ± 0.910), Neuroticism (2.38 ± 1.203), Personality (2.52 ± 0.820), and Verbal aggression (0.98 ± 1.000) scales. Seventh grade adolescents showed the highest scores on the three Physical aggression (1.30 ± 1.351), Aggression behavior (1.37 ± 1.181), and Aggression (1.54 ± 1.146) scales, and 6th graders showed low scores on the three scales, Physical aggression (1.01 ± 1.222), Aggression behavior (0.99 ± 0.991) and Aggression (1.19 ± 0.976). Finally, the Anger scale showed the highest scores in 8th graders (2.42 ± 1.851) and the lowest in 6th graders (2.07 ± 1.739) shown in Table 1.

The ANOVA results showed statistically significant differences by gender in personality traits and aggressive behavior except for the Extraversion scale. The score of boys is higher than that of girls gender on the scales Verbal aggression (1.45 ± 1.243), Physical aggression (1.31 ± 1.334), Aggression behavior (1.39 ± 1.168), and Aggression (1.48 ± 1.131). In contrast, girls score higher than boys on the Neuroticism (2.99 ± 1.188), Personality (2.87 ± 0.784), and Anger (2.73 ± 1.889) scales shown in Table 1.

Inferential Analysis

To examine study hypotheses, a MANOVA was conducted with gender and school year as independent variables, and the E and N subscales as dependent variables. Before analyzing MANOVA, a preliminary analysis to test the absence of multicollinearity and homogeneity of covariance matrices was carried out by the researchers. According to Meyer and Peng⁷⁶ the dependent variables would be correlated with each other, therefore the authors used Pearson correlations to examine this MANOVA assumption between two dependent variables. The correlation value should be lower than 0.90.⁷⁷ Table 2 reported that the correlation value $r = 0.098$ ($p < 0.01$) which was lower than 0.90. Consequently, there was a meaningful pattern of correlations between two dependent variables, this model met the criteria of using MANOVA.

The study was used Box's M test to investigate the multivariate homogeneity of covariance matrices; the M value of 26.201 was significant ($p = 0.201 > 0.05$), owing to this, this assumption of homogeneity of covariance matrices was appropriate. Consequently, Wilks' Lambda was used to interpret the result of MANOVA.

Table 2 Correlation Between Extraversion and Neuroticism

		Extraversion	Neuroticism
Extraversion	Pearson Correlation	-	0.098**
	Sig. (2-tailed)		<0.001
Neuroticism	N	3003	3003
	Pearson Correlation	0.098**	
	Sig. (2-tailed)	<0.001	
	N	3003	3003

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

Abbreviation: N, number of participants.

Levene's test of equality of error variances was used to test the assumption of MANOVA. Whether the p value of Levene's is more than 0.05, this result met the assumption of homogeneity of variance owing to the null hypothesis for the test that the error variance of the dependent variable is the same throughout the dataset. The findings of this research indicated that the value of Levene's test came out to be no significant for all the variables in the Extraversion subscale [$F(7, 2995) = 0.345$, $p = 0.933$, $p > 0.05$], and Neuroticism subscale [$F(7, 2995) = 0.870$, $p = 0.530$, $p > 0.05$]. Therefore, the p value of the Levene's test in this study met the assumption.

There was a significant difference in personality traits between Gender when jointly considering Extraversion and Neuroticism variables, Wilks' Lambda value = 0.949; $F(2, 2994) = 80.424$, $p < 0.01$, partial $\eta^2 = 0.051$. Therefore, the results suggest that the first hypothesis (H1) should be rejected. A separate ANOVA was conducted for each dependent variable, with each ANOVA evaluated at an alpha level of 0.025 (that is, 0.05/2). There was no significant difference between Gender for Extraversion; $F(1, 2995) = 0.033$, $p = 0.856$, partial $\eta^2 < 0.01$. There was a significant difference between Gender for Neuroticism; $F(1, 2995) = 159.146$, $p < 0.001$, partial $\eta^2 = 0.050$, with Boys ($M = 2.384$, $SD = 0.032$) scoring lower than Girls ($M = 2.961$, $SD = 0.032$) as shown in Table 3.

There was a significant difference in personality traits according to school years; Wilks' Lambda = 0.982, $F(6, 5988) = 8.868$, $p < 0.01$, partial $\eta^2 = 0.009$. Therefore, the results suggest that the second hypothesis (H2) should be rejected. A separate ANOVA was conducted for each dependent variable. There was no significant difference between school years of students in terms of Extraversion; $F(3, 2995) = 2.619$, $p = 0.049 > 0.025$, partial $\eta^2 = 0.003$. There was a significant difference between students in grade 6, grade 7, grade 8 and grade 9 on Neuroticism; $F(3, 2995) = 16.172$, $p < 0.001$, partial $\eta^2 = 0.016$. Students in grade 9 ($M = 2.857$, $SD = 0.057$) experienced more Neuroticism than others as shown in Table 3.

The results show that there is a significant multivariate effect on Extraversion and Neuroticism in the interaction between gender and school year; Wilks' Lambda = 0.996, $F(6, 5988) = 2.121$, $p = 0.048$, partial $\eta^2 = 0.002$. Therefore, the results suggest that the third hypothesis (H3) should be rejected. A separate ANOVA was conducted for each dependent variable. There was no significant difference between school year and gender on Extraversion; $F(3, 2995) = 2.467$, $p = 0.060$, partial $\eta^2 = 0.002$. There was no significant difference in Neuroticism; $F(3, 2995) = 1.996$, $p = 0.112$, partial $\eta^2 = 0.002$ as shown in Table 3.

Table 4 indicates the correlation between personality traits and aggression behaviors, gender, and school year. The results are significant, the personality traits had a moderately positive correlation with verbal aggression ($r = 0.310$, $p <$

Table 3 Combined Univariate ANOVA

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Extraversion	14.421 ^a	7	2.060	2.334	0.022	0.005
	Neuroticism	353.761 ^b	7	50.537	38.043	<0.001	0.082
Intercept	Extraversion	19,053.193	1	19,053.193	21,585.481	<0.001	0.878
	Neuroticism	18,122.782	1	18,122.782	13,642.356	<0.001	0.820
Gender	Extraversion	0.029	1	0.029	0.033	0.856	<0.001
	Neuroticism	211.413	1	211.413	159.146	<0.001	0.050
School_year	Extraversion	6.937	3	2.312	2.619	0.049	0.003
	Neuroticism	64.451	3	21.484	16.172	<0.001	0.016
Gender*	Extraversion	6.532	3	2.177	2.467	0.060	0.002
	Neuroticism	7.956	3	2.652	1.996	0.112	0.002
Error	Extraversion	2643.643	2995	0.883			
	Neuroticism	3978.619	2995	1.328			
Total	Extraversion	25,176.160	3003				
	Neuroticism	25,959.465	3003				
Corrected Total	Extraversion	2658.064	3002				
	Neuroticism	4332.380	3002				

Notes: ^aR Squared = 0.005 (Adjusted R Squared = 0.003). ^bR Squared = 0.082 (Adjusted R Squared = 0.080). *Interaction effect.

Table 4 Pearson Correlations, Mean, and Standard Deviations Among Study Variables

	Mean	SD	Personality	Verbal Aggression	Physical Aggression
Personality traits	2.71	0.798			
Verbal Aggression	1.32	1.210	0.310**		
Physical Aggression	1.2	1.311	0.266**	0.657**	
Anger	2.32	1.826	0.464**	0.371**	0.390**

Note: ** $p < 0.01$: Correlation is significant at the 0.01 level (2-tailed).

Abbreviations: M, Mean; SD, Standard deviation.

0.01); a weak positive correlation with physical aggression ($r = 0.266$, $p < 0.01$); a moderately positive correlation with anger ($r = 0.464$, $p < 0.01$). This result shows that the higher levels of personality traits students had, the higher levels of verbal aggression they had. Additionally, students with higher levels of physical aggression and anger had stronger personality traits than others and vice versa.

Mediation Analysis

A model of mediation analysis was used to examine whether Anger (AG) mediated the relationship between Personality traits (P) and Physical aggression (PA). Mediation analyses were based on 5000 bootstrapped samples using bias-corrected and accelerated 95% confidence intervals.⁷² Table 5 presents the results of the mediation analysis. First, we showed that the regression of the personality traits on the mediator, anger, was positive and significant ($b = 1.0615$, $SE = 0.0370$, $p < 0.001$). In next step of the mediation process showed that the mediator (anger), controlling for physical aggression was also positive and significant ($b = 0.2442$, $SE = 0.0136$, $p < 0.001$). Then, in the mediation model, the regression of personality traits with the physical aggression, ignoring the mediator, was significant ($b = 0.1771$, $SE = 0.031$, $p < 0.001$). Finally, a measure was presented, which indicated the indirect effect of personality traits on physical aggression through anger was supported ($b = 0.2592$, $SE = 0.0186$, 95% CI = [0.2237, 0.2957]). Therefore, the results suggest that the forth hypothesis (H4) should be accepted. In these analyses, mediation is significant if the 95% Bias Corrected and accelerated confidence intervals for the indirect effect do not include 0.⁷² In addition, we also present the results of the total effect showing positive and significant results ($b = 0.4363$, $SE = 0.0289$, $p < 0.001$). Therefore, anger partially mediated the relationship between personality traits and physical aggression (Figure 1).

A similar approach by mediation analyses based on 5000 bootstrapped samples was used by us to examine the relationship between personality traits and verbal aggression through anger mediators. In these analyses, mediation is significant if the 95% Bias Corrected and accelerated confidence intervals for the indirect effect do not include 0.⁷² The results of the mediation analysis are presented in Table 6. The figures indicated that the regression of the personality traits on the mediator, anger, was positive and significant, $b = 1.0615$, $SE = 0.037$, $p < 0.001$. The next step of the mediation process showed that the mediator (anger), controlling for verbal aggression was positive and significant ($b = 0.1919$, $SE = 0.0125$, $p < 0.001$). In the third step of the mediation model, the regression of personality traits with verbal aggression, and ignoring the mediator was also significant and positive ($b = 0.2662$, $SE = 0.0286$, $p < 0.001$). Finally, results revealed that mediating role of anger was a positive and significant predictor of the relationship between personality traits and verbal aggression ($b = 0.2037$, $SE = 0.0159$, 95% CI = [0.1729, 0.2361]), such participants who indicated highly

Table 5 Effect of Personality Traits on Physical Aggression Through Anger

Effects	Point Estimate	SE	P	95% CI
Personality traits – Anger	1.0615	0.037	<0.001	0.9890–1.1340
Anger – Physical Aggression	0.2442	0.0136	<0.001	0.2176–0.2708
Personality traits – Physical Aggression	0.1771	0.031	<0.001	0.1163–0.2378
Personality traits – Anger – Physical Aggression	0.2592	0.0186	–	0.2237–0.2957
Total effect	0.4363	0.0289	<0.001	0.3796–0.4929

Abbreviations: CI, Confidence interval; SE, Standard error.

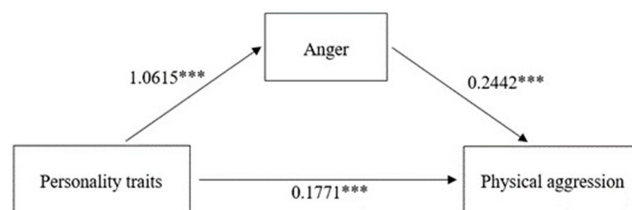


Figure 1 Mediation model of the indirect effect of anger on the correlation between personality traits and physical aggression.

Note: *** $p < 0.001$.

expressed personality traits were highly likely to exhibit verbal aggression, and through high levels of anger in adolescent. Therefore, the results suggest that the fifth hypothesis (H5) should be accepted. Besides, the results of the total effect are positive and significant results ($b = 0.47$, $SE = 0.0263$, $p < 0.001$). Therefore, anger partially mediated the relationship between personality traits and verbal aggression (Figure 2).

To investigate a sample multiple mediation analysis was performed. Multiple mediation analyses were based on 5000 bootstrapped samples using bias-corrected and accelerated 95% confidence intervals.⁷² Table 7 presents the results of the multiple mediation analysis.

The outcome variable for analysis was “Physical Aggression (PA)”. The predictor variable for analysis was “Personality Traits (P)”. The mediator variable for analysis was “Verbal Aggression (VA)” and “Anger (AG)”. First, we show the direct effect of personality traits on verbal aggression ($b = 0.47$, $SE = 0.0263$, $p < 0.001$) and anger ($b = 1.0615$, $SE = 0.037$, $p < 0.001$) is positive and significant. Next, we show the direct effect of verbal aggression on intention to physical aggression is positive and significant ($b = 0.6426$, $SE = 0.016$, $p < 0.001$). The direct effect of anger on intention to physical aggression is also positive and significant ($b = 0.1209$, $SE = 0.0113$, $p < 0.001$). Then, the analyses revealed that the regression of personality traits with physical aggression, ignoring the mediator, was not significant ($b = 0.006$, $SE = 0.0253$, $p = 0.8126$). In these analyses, mediation is significant if the 95% Bias Corrected and accelerated confidence intervals for the indirect effect do not include 0 (Preacher & Hayes, 2004; Preacher et al, 2007; Hayes, 2013). The indirect effect of personality traits via verbal aggression ($b = 0.3020$, $SE = 0.0208$, 95% CI = [0.2610, 0.3426]) and anger ($b = 0.1283$, $SE = 0.0152$, 95% CI = [0.0990, 0.1589]) is positive and statistically significant. Along with indirect effects, the total effect is also positive and statistically significant results ($b = 0.47$, $SE = 0.0263$, $p < 0.001$). Therefore, verbal aggression and anger fully mediated the relationship between personality traits and physical aggression (Figure 3).

Discussion

This study had three primary objectives: first, to examine personality traits among Vietnamese secondary school students; second, to investigate the relationship between personality traits and physical aggression of secondary school students; and third, anger was a mediator of personality traits on physically aggressive behavior in adolescents.

Gender differences in personality traits have been extensively researched and thoroughly documented. The findings revealed a statistically significant gender difference, with boys showing lower levels of neuroticism than girls.^{78–80} Physical development and the production of androgen hormones are defining characteristics of adolescence. Different

Table 6 Effect of Personality Traits on Physical Aggression Through Verbal Aggression

Effects	Point Estimate	SE	P	95% CI
Personality traits – Anger	1.0615	0.0370	<0.001	0.9890–1.1340
Anger – Verbal aggression	0.1919	0.0125	<0.001	0.1674–0.2164
Personality traits – Verbal aggression	0.2662	0.0286	<0.001	0.2102–0.3223
Personality traits – Anger – Verbal Aggression	0.2037	0.0159	–	0.1729–0.2361
Total effect	0.4700	0.0263	<0.001	0.4184–0.5215

Abbreviations: CI, Confidence interval; SE, Standard error.

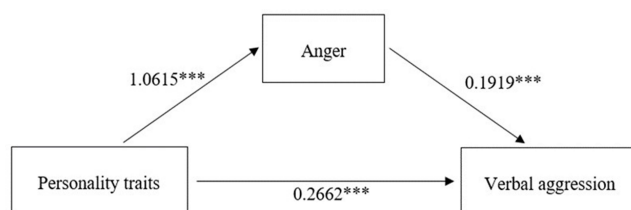


Figure 2 Mediation model of the indirect effect of anger on the correlation between personality traits and verbal aggression.

Note: *** $p < 0.001$.

hormone functions influence the mood of boys and girls. During adolescence, boys experience a surge in testosterone levels which can lead to increased aggression and risk-taking behavior, while girls experience an increase in estrogen and progesterone which can cause mood swings and emotional instability. These hormonal changes can have a significant impact on the social and emotional development of adolescents. Moreover, hormone functions influence personality and genetic susceptibility to psychopathology. Androgen hormones also explain adolescents' interests, activities, and aggressive tendencies.⁷⁸ Research has also shown that hormone imbalances can lead to mood disorders such as depression and anxiety. Understanding the role of hormones in mental health can help inform treatment options for individuals experiencing these conditions. Females exhibit hormonal fluctuations more frequently than boys. As a result of having monthly periods, girls tend to be more emotionally unstable. Girls experience a greater variety of psychological and social issues than boys during adolescence. Girls are more conscious of gender stereotypes and unfavorable gender expectations than boys. Girls have a more unfavorable impression of themselves and body image than boys. This can lead to lower self-esteem and confidence in girls, which can have negative effects on their academic and social performance. It is important to address these gender disparities and promote positive body image and self-perception for all children. Negative life situations may promote girl neuroticism more than boy neuroticism. Girls tend to have greater negative affect, be more subservient and nurturing, and be more emotionally worried than boys. Boys are more forceful and have more ideas than girls. Biologically, girls are more susceptible to hormone fluctuations that profoundly alter their emotions than boys. Hence, females are typically more neurotic than males.⁷⁸ This difference in neuroticism between genders may contribute to the higher rates of anxiety and mood disorders observed in women. However, it is important to note that societal and cultural factors also play a significant role in shaping gender differences in emotional expression and mental health outcomes.

Secondly, students with higher levels of physical aggression and anger had stronger personality traits than others, and vice versa. The study suggests that interventions targeting personality traits may be effective in reducing physical aggression and anger among students. It also highlights the importance of addressing underlying psychological factors in preventing violent behavior. When aggressive behaviors occur, the sensitivity of individual responses diminishes or even vanishes, which is reflected at the cognitive level as aggressive traits.⁸¹ Therefore, it is crucial to provide individuals with the necessary psychological support and interventions to address these underlying factors and prevent violent

Table 7 Effect of Personality Traits on Physical Aggression Through Verbal Aggression and Anger

Effects	Point Estimate	SE	P	95% CI
Personality traits – Verbal Aggression	0.47	0.0263	<0.001	0.4184–0.5215
Personality traits – Anger	1.0615	0.037	<0.001	0.9890–1.1340
Verbal Aggression – Physical Aggression	0.6426	0.016	<0.001	0.6113–0.6739
Anger - Physical Aggression	0.1209	0.0113	<0.001	0.0986–0.1431
Personality traits - Physical Aggression	0.006	0.0253	0.8126	–0.0436–0.0557
Personality traits - Verbal Aggression - Physical Aggression	0.302	0.0208	<0.001	0.2610–0.3426
Personality traits – Anger - Physical Aggression	0.1283	0.0152	<0.001	0.0990–0.1589
Total effect	0.4363	0.0289	<0.001	0.3796–0.4929

Abbreviations: CI, Confidence interval; SE, Standard error.

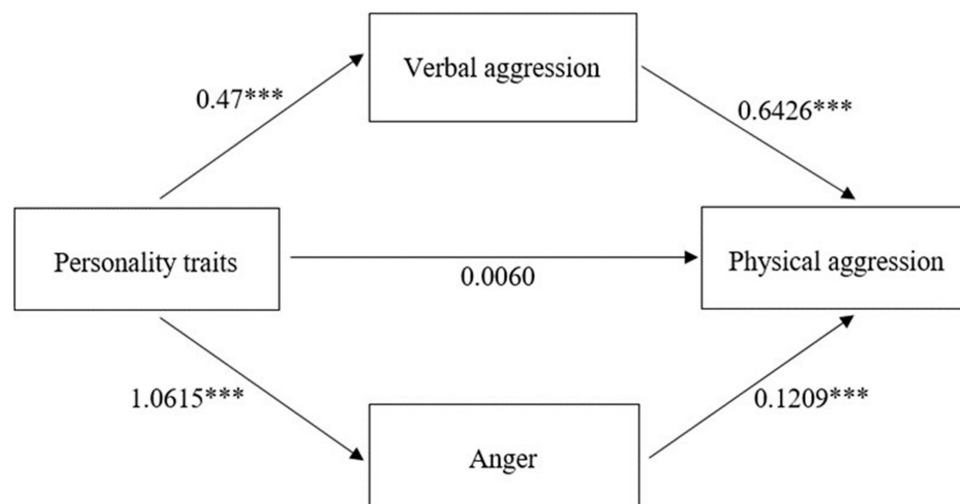


Figure 3 Multiple mediation model of the indirect effect of verbal aggression and anger on the correlation between personality traits and verbal aggression.
Note: *** $p < 0.001$.

behavior from occurring in the first place. Additionally, early identification and intervention can be key in addressing these psychological factors before they escalate into violent behavior. Therefore, it is crucial to provide appropriate psychological interventions and therapies to individuals who display violent behavior to address the underlying factors and prevent future occurrences of aggression. These interventions may include anger management techniques, cognitive-behavioral therapy, and social skills training. It is important to address the root causes of aggression, such as past trauma or substance abuse, to effectively reduce violent behavior. Additionally, creating a supportive environment that promotes healthy coping mechanisms and emotional regulation can also aid in preventing violent behavior. Individuals are more likely to believe that violence is understandable, common, and inevitable, thereby enhancing their aggressive personalities.⁸¹ Therefore, it is crucial to educate individuals on the negative consequences of violent behavior and provide them with alternative ways to handle their emotions and conflicts. This can help reduce the likelihood of violent behavior and promote a safer and healthier society.

A third goal of the study is now to test whether anger mediates the impact of personality traits on physically aggressive behavior in adolescents. With respect to this goal, the results were in line with our expectations once confirmed the partial mediating role of anger in the relationship between personality traits and physical aggression. This result confirmed two important implications. First, there is a direct association between personality traits and physical aggression, which is consistent with findings found previously. Second, as a mediator, anger both directly influences physical aggression and mediates the relationship between personality traits and physical aggression. This result is consistent with previous studies by Barlett and Anderson,⁸² García-Sancho, Dhont, Salguero and Fernández-Berrocal,⁸³ which jointly confirmed the influence of the mediating factor is anger in the relationship between personality traits and physical aggression. In addition, Barlett and Anderson⁸² also suggest that some personality variables in Big Five such as agreeableness and neuroticism are related to physical aggression, through aggressive emotions. Another of our findings suggests that anger is a potential mediator of the association of personality traits and verbal aggression in adolescents. This result suggests that anger plays a dual role when acting both directly and indirectly in verbal aggression. These results are consistent with previous research by García-Sancho, Dhont, Salguero and Fernández-Berrocal⁸³ conducted in Spain that showed a mediating role of anger in the relationship between personality traits and aggressive behavior, consisting of verbal aggression. This suggests that if personality traits including extraversion and neuroticism are positively developed with an increase in anger, they will be at risk of triggering aggressive behaviors, namely verbal aggression. According to Dewi,⁸⁴ levels of rage were a risk factor for exhibiting various forms of aggression such as physical, verbal, and relational aggression. This result is also consistent with several other similar studies regarding the role of anger and anger control on aggressive behavior. Together with García-Sancho, Dhont,

Salguero and Fernández-Berrocal,⁸³ our current study has demonstrated a mediating role for anger in the association between personality traits and various forms of aggressive behavior including verbal aggression. This has once again reconfirmed the relationship between personality traits and anger-mediated aggression found in Barlett and Anderson,⁸² as well as broadened the understanding of the mediating role of anger in the relationship between personality traits and other forms of aggression, namely verbal aggression. Consistent with Hypothesis six, we found that verbal aggression mediated the relationship between personality traits and physical aggression in adolescence. The research results demonstrated that verbal aggression could affect physical aggression directly. In addition, it implied that personality traits affect physical aggression indirectly through verbal aggression. The basic paths suggested that the impact leading from personality traits to physical aggression was greater for those with verbal aggressiveness and diminished for those with less verbal aggression. To our knowledge, this is the first time that a mediating role of verbal aggression in the relationship between personality traits and physical aggression has been found in a study. However, a direct correlation among personality traits, physical aggression, and verbal aggression has been mentioned in several previous studies. These relationships are explicable as follows: First, there is evidence that personality traits are associated with the manifestation of physically aggressive behaviors⁸⁴. Second, expressions of verbal aggression are correlated with physical aggression, consistent with previous research results.⁸⁵

Limitations

Research results have provided more insights into aggressive behaviors as well as the relationship of personality traits to these behaviors. However, for the present, our study still has some limitations. The first limitation is that the sample is not evenly distributed, especially the demographic variables. Specifically, the number of students in grades 6 and 9 is larger than that of the other two grades, grades 7 and 8. Differences among groups in the study may have a certain influence on the accuracy of the study. Numerous authors have discussed how crucial sample size is for conducting research.^{86–88} According to Faber and Fonseca,⁸⁹ two studies that used the same approach and produced equal results but had different sample sizes could provide distinct directions for the researcher. Therefore, subsequent research needs to verify and assess the findings of the currently ongoing research. The second limitation of this investigation is that it relied on participants to provide their reports. Concerns regarding the use of self-report to evaluate aggressive behavior were mentioned in previous studies.^{71,90} According to critics of self-report methodologies, individuals are likely to underreport their undesirable behaviors due to social desirability concerns.^{91–93} This should have resulted in lower variance, which would have diminished the test's ability to discover significant connections between variables.⁹⁰ Future research should consider using multiple methods in assessing aggressive behaviors such as observations, interviews, or assessments from other stakeholders such as teachers, guardians, etc.

Implications

Aggressive behaviors in particular or issues related to violence are at risk of increasing in complexity with various forms and classifications such as direct and indirect aggression,^{94–96} reactive and proactive aggression,^{97–99} and physical and verbal aggression.^{84,100,101} This suggests that issues related to aggression will continue to affect the lives and relationships of individuals, and their interactions in groups and in society. The relationship between personality traits and aggressive behavior has been examined in many studies around the world. This relationship has far-reaching effects on mental health, education, and research. In the field of mental health, understanding the relationship between personality traits and aggression in secondary students can help clinicians identify high-risk individuals and provide targeted interventions. Identifying the specific personality traits associated with aggressive behavior can help mental health professionals tailor interventions that focus on developing coping mechanisms, emotion regulation skills, and impulse control. In addition, it can help to reduce the stigma surrounding aggressive behavior and promote understanding of the complex psychological factors that contribute to it.

In the field of education, understanding the relationship between personality traits and aggressive behavior can help teachers and school administrators develop strategies to address aggressive behavior in secondary students. By identifying the specific personality traits associated with aggression, educators can develop targeted interventions that focus on promoting positive behavior, reducing negative behavior, and providing students with the tools they need to manage their

emotions and behavior effectively. This can include interventions such as counseling, social skills training, and classroom-based interventions that focus on positive reinforcement and behavior modification.

In the field of research, the relationship between personality traits and aggressive behavior in secondary students can provide valuable insights into the factors that contribute to aggressive behavior in this population. By identifying the specific personality traits that are associated with aggression, researchers can develop theoretical models that can guide future research and interventions. This can include examining the impact of environmental factors such as family and peer relationships, as well as individual factors such as cognitive processes, emotion regulation, and personality traits. This can help researchers to develop a more comprehensive understanding of the complex psychological factors that contribute to aggressive behavior in secondary students.

By understanding the relationship between personality traits and aggressive behavior, clinicians, educators, and researchers can develop targeted interventions that focus on promoting positive behavior, reducing negative behavior, and providing individuals with the tools they need to manage their emotions and behavior effectively. This can help to reduce the negative impact of aggressive behavior on individuals, families, and communities, and promote positive mental health and well-being.

Conclusion

Our current study has contributed more insights into this relationship, specifically as follows research results show an interaction between personality traits and aggressive behavior in both direct and indirect terms; research has shown a mediating role of anger or verbal aggression or both in different models regarding the association between personality traits and aggressive behavior; and our study also presents the influence of qualitative variables including gender variable and grade variable on the aggressive behavior of adolescents. The study results reported differences in aggressive behavior in boys and girls. The results also show that children who are studying in different grades have different levels of aggressive behavior. Besides contributing to our understanding of the link between personality traits and aggressive behavior, our research is also useful in enhancing the understanding of teachers and families about the role of individual factors in students' life and development, especially personality characteristics as well as the importance of personality education adolescents today. By gaining a better understanding of the causes and correlates of aggressive behavior, researchers can identify risk factors and protective factors, which can inform the development of effective prevention and intervention programs. For example, researchers have found that certain individual variables, such as personality traits, can influence the likelihood of engaging in aggressive behavior. By identifying which personality traits are most strongly associated with aggression, researchers can develop targeted interventions that focus on modifying those traits or teaching individuals how to manage them effectively. Furthermore, understanding aggressive behavior can also inform the development of educational programs and policies in schools. Schools can play an important role in promoting positive social and emotional development and preventing aggressive behavior. By incorporating evidence-based practices into their policies and programs, schools can create safe and supportive environments that promote healthy social interactions and reduce the likelihood of aggressive behavior. Finally, understanding aggressive behavior is important for preventing aggressive behavior in society. By developing a more comprehensive understanding of the factors that contribute to aggressive behavior, researchers can inform public policy and develop interventions that address the root causes of aggression. For example, policies and interventions that focus on reducing poverty, improving mental health services, and promoting healthy family relationships can all contribute to reducing the prevalence of aggressive behavior in society. In conclusion, researchers need to continue to learn about aggressive behavior and its effects on individuals and society to develop effective prevention and intervention strategies. By understanding the individual variables that contribute to aggressive behavior, developing evidence-based educational programs and policies, and informing public policy and interventions, we can work together to reduce the negative impact of aggressive behavior on individuals, families, and communities. Additionally, we used the STROBE checklist in reports of this cross-sectional study.

Acknowledgments

We acknowledge the instructors and all the participants who supported us in collecting the data for this research.

Disclosure

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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