



A Structural Equation Modeling of Aggression, Distress, and Their Impact on Academic Success

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ABSTRACT: Analyzing the relationship between adolescents' aggression, distress, and academic achievement is vital for identifying the key factors that affect educational outcomes.

The aim of this study was to investigate the potential mediating role of aggression in the relationship between psychological distress and academic success among adolescents in Azerbaijan (N = 271; M = 14.26, SD = 1.7). Data were collected using the Buss Perry Aggression Questionnaire-Short form (BPAQ-SF), and The Children and Adolescents Psychological Distress Scale (CAPDS-10). The obtained results demonstrated that higher levels of aggression were inversely related to academic success, while distress also showed a negative correlation with academic success. Using structural equation modeling (SEM), it was found that aggression fully mediated the connection between psychological distress and academic success. In conclusion, the study's findings enrich the current body of literature and offer valuable insights for school psychologists, educators, and parents, enabling them to implement targeted interventions in this domain.

KEY WORDS: Aggression, academic success, psychological distress, structural equation modeling

Schools are integral to enhancing the emotional well-being of children in the 21st century, as teachers contribute to the development of self-esteem and motivation by fulfilling roles as role models, mentors, and educators (Choi, 2018). Schools are not solely academic institutions; rather, they possess a distinct social and cultural climate that fosters a socio-cultural environment for students (Çöğmen & Özelçi, 2021). Research indicates that students achieve optimal results in the learning process when their reports are connected to the lesson content and they engage actively in the learning activities. (Aliyev & Jabbarov, 2008). The concept of school life quality, first introduced in the field of education by Epstein and McPartland (1976), is examined through three main dimensions: overall satisfaction with the school, connection to the school, and attitudes toward teachers. Epstein and McPartland later expanded this framework to include five dimensions of school life quality: students' positive or negative feelings toward the school, school management, teachers, student-student communication, and status.

Psychologically, students may perceive their achievement or failure in terms of feelings of success or failure, depending on whether their performance aligns with their personal expectations. School achievement is largely a subjective experience; the same outcome can be seen as a success by one student and as a failure by another (Paisi, 2015).

A substantial number of students attending school face significant challenges in obtaining a passing grade, let alone achieving academic success. According to the most recent global data, over 612 million students worldwide were unable to meet the minimum academic proficiency required for a passing grade in 2018 (United Nations, 2020). Additionally, those who do manage to pass often fail to achieve the academic performance necessary to qualify for higher education.

One of the psychological phenomena frequently observed in students, particularly adolescents, is aggression, which can impact academic success. Aggression is a complex phenomenon that can manifest in various degrees, from minor behaviors (such as pushing or pinching) to more severe actions (such as hitting, kicking, or punching), and even extreme acts (such as stabbing, shooting, or killing) (Coyne & Archer, 2005). These diverse expressions of aggression can sometimes complicate the determination of whether a specific act qualifies as aggressive. Similar to other psychological constructs, this issue is further exacerbated by the disparity between the academic definitions of aggression and the common interpretations held by the general public (Rustamov et al., 2023). The term "aggression" is frequently used in contexts that do not align with its precise social-psychological definition. For example, individuals may describe an insistent salesperson as "aggressive," encourage athletes to adopt a "more aggressive" approach, or label swift mood changes as "violent" (Carlson et al., 1989). It is a complex behavior associated with a higher risk of mental health issues (Chandler & Lawrence, 2022) and can result from various factors, including poor impulse control and exposure to physical aggression (Marcus, 2017).

Aggressive behavior is characterized not by its actual consequences (such as whether harm or injury occurs), but by the underlying intention to inflict harm or injury on another individual. In other words, even in the absence of actual harm to the target, behavior is deemed aggressive if it is motivated by the intent to cause harm (Estévez et al., 2018). The critical element in the intent to harm is that the individual exhibiting aggression recognizes and understands that their actions have the potential to cause harm or injury to the intended target.

Aggression in this age group can have detrimental effects on both the aggressor and the victim, leading to physical harm, emotional distress, social isolation, academic difficulties, and potential legal repercussions. Furthermore, it can have lasting impacts on mental health, contributing to conditions such as depression, anxiety, and post-traumatic stress disorder (Behrhorst et al., 2019; Copeland-Linder et al., 2010).

Research indicates that aggression has detrimental effects on mental health (Heizomi et al., 2021). Specifically, verbal aggression is linked to mental health issues in adolescents and young adults (Aloia & Solomon, 2015; Moore et al., 2014). Moreover, aggression is generally negatively correlated with both mental health and overall well-being. Additionally, parental verbal aggression has been found to have an adverse impact on the mental well-being of children (Qutaiba & Tamie, 2010; Aloia, 2022).

Stressors, defined as significant irritants, initiate the general adaptation syndrome or stress response in the body, with the final stage manifesting as distress. Selye introduced the term "eustress syndrome" to describe the physiological changes that support the organism's health maintenance, whereas the process characterized by the predominance of pathogenic factors was labeled as "distress syndrome." The illnesses arising from distress syndrome were classified by Selye as "adaptation diseases." In this framework, psychological disturbances, such as depression and anxiety disorders, as well as physiological issues, emerge as a consequence.

In adolescents, elevated levels of psychological distress are viewed as a key indicator of psychological crisis. Psychological distress is commonly defined as an emotional condition marked by symptoms of depression (such as loss of interest, sadness, and hopelessness) and anxiety (such as excessive worry and tension) (Samuel, 2021). A review of the scientific literature shows that the term "psychological distress" is frequently used to describe an undifferentiated amalgamation of symptoms, which may include depression, generalized anxiety, personality traits, functional impairments, and behavioral issues. Furthermore, psychological distress serves as a diagnostic criterion for several psychiatric conditions, such as obsessive-compulsive disorder and post-traumatic stress disorder, as well as other disorders that disrupt daily functioning, including major depression and generalized anxiety disorder (Drapeau et al., 2012).

Several studies have documented a negative correlation between distress symptoms and academic success at school (Forsterling & Binser, 2002; Shahar et al., 2006). Additionally, research suggests that conduct disorders, hyperactivity, and difficulties in peer relationships may also contribute to poor academic outcomes (Biederman et al., 2004; Prior et al., 2005; Rucklidge & Tannock, 2001; Rotheron et al., 2009).

Elevated levels of aggressive behavior in adolescents are associated with a detrimental effect on their academic performance and outcomes. Specifically, higher aggression levels are linked to a decrease in academic success. The primary aim of the present study is to explore the mediating role of psychological distress in the relationship between aggression and academic achievement.

Hypothesis 1. Lower levels of distress predict higher levels of academic success.

Hypothesis 2. Aggression predicts academic success negatively

Hypothesis 3. Distress plays a mediation role among aggression and academic success.

METHODOLOGY

Research Design

The analysis was conducted using Structural Equation Modeling (SEM), a widely recognized method in quantitative research, to examine the mediating role of distress between academic success and aggression among adolescents at schools in Azerbaijan. The application of SEM in this context offers a powerful statistical tool for evaluating complex hypotheses and uncovering both direct and indirect relationships between academic success, distress, and aggression. This approach is especially beneficial in educational research, where various interconnected factors simultaneously shape outcomes in multifaceted ways.

Sample and Data Collection

The current study was conducted with a sample of 271 adolescents studying at fourth, seventh and eleventh grade at schools in Azerbaijan. The participant group comprised 144 females (53.1%) and 127 males (46.9%), with ages ranging from 9 to 18 years ($M = 14.26$, $SD = 1.7$).

The majority of the students ($n = 228$, 84.1%) reported that their parents are together, married, while a portion stated that their parents are divorced ($n = 36$, 13.3%), and 7 students mentioned that one of their parents had passed away.

Regarding the economic situation of their parents, 88.9% of the students ($n = 241$) stated that their parents are able to meet their needs, 10.7% ($n = 29$) mentioned that their needs are partially met by their parents, and only one student reported that their parents are unable to meet their needs at all.

In the survey, 76.8% of the students ($n = 208$) highly rated their relationship with their teachers, while 84.1% of the students ($n = 228$) rated their relationship with their family as positive.

Measures

The Buss-Perry Aggression Questionnaire-Short Form (BPAQ-SF) is designed by Bryant and Smith to measure the extent of aggressive behavior and violent tendencies in individuals. The scale includes 12 items (e.g., "Sometimes I fly off the handle for no good reason"), with responses ranging from 1 (very uncharacteristic of me) to 5 (very characteristic of me). The BPAQ-SF is divided into four sub-scales: physical aggression, verbal aggression, anger, and hostility. Higher scores reflect a greater level of aggression.

The Children and Adolescents Psychological Distress Scale (CAPDS-10), designed by De Stefano (2022), consists of 10 items (e.g., "I have disobeyed or I have opposed my parents"). This scale measures psychological distress on a 4-point Likert scale, with responses ranging from 0 (not at all) to 3 (almost every day). The internal consistency of the CAPDS-10 was found to be adequate, with a Cronbach's alpha of .86.

RESULTS

The descriptive statistics (mean, standard deviation, skewness and kurtosis) and Pearson correlation coefficients for present study variables are demonstrated in Table 1. The analysis revealed a significant negative correlation between academic success and aggression ($r = -0.54$, $p < 0.001$), indicating a Robust relationship between these factors. Additionally, academic success was negatively correlated as well as with psychological distress ($r = -0.398$, $p < 0.001$). Finally, psychological distress demonstrated a positive correlation with adolescents' aggression ($r = 0.693$, $p < 0.001$), highlighting a significant positive relationship between these variables.

Table 1. Descriptive Statistics and Correlations Among Variables

Variable	Mean	SD	Skewness	Kurtosis	1	2
Academic Success	1.68	.540	-.057	-.688	-	
Aggression	2.38	.778	.721	.458	-.354**	-
Distress	6.97	4.28	1.118	.835	-.398**	.693**

** $p < .001$

The first phase of the study was evaluating a measurement model that included aggression, academic success and psychological distress. This model utilized six observed variables as indicators for the latent constructs. At the outset, the complete mediation model was assessed. The findings indicated that the full mediation model demonstrated a satisfactory fit to the data: $\chi^2(12, N = 136.98) = 11.34$, $p < .001$; CFI = .993; RFI = .966; IFI = .993; NFI = .982; TLI = .986; RMSEA = .050. All standardized factor loadings were found to be statistically significant, ranging from .302 to .821 ($p < .001$) showing in Figure 1, indicating that all observed variables strongly contributed to their respective latent constructs.

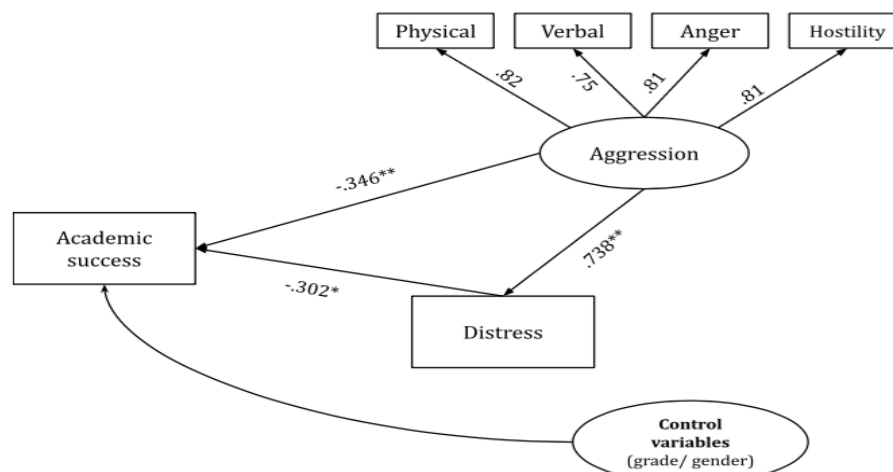


Figure 1. Structural Equation Model

Furthermore, all paths in the final model were found to be statistically significant. Aggression had a positive influence on psychological distress ($\beta = .738, p < .001$), whereas aggression had a negative direct effect on academic success ($\beta = -.346, p < .001$). Academic success was negatively predicted by aggression ($\beta = -.346, p < .001$) and negatively predicted by psychological distress ($\beta = -.302, p < .01$). The indirect effect of aggression on academic success through psychological distress was significant ($\beta = -.233, p < .01$). The final model is depicted in Figure 1.

DISCUSSION

The study explored the mediating effect of aggression on the relationship between academic success and distress. The findings revealed that *distress* had a negative predictive relationship with academic success (H1) while aggression had a negative predictive relationship with academic success (H2). Furthermore, distress acted as a partial mediator in the relationship between academic success and aggression (H3). Consequently, all the research hypotheses were supported by obtained results. The research findings indicate that higher levels of aggression are associated with lower academic success. Similarly, prior studies have shown a negative relationship between aggression and academic achievement.

The findings of this study suggest that individuals exhibiting high levels of aggression also experience higher levels of distress. This aligns with previous research, which has identified a positive correlation between distress and aggression (Deng et al., 2024). Additionally, existing literature indicates that distress has a detrimental impact on the mental well-being of adolescents. Adolescents with lower levels of well-being are more likely to exhibit distress symptoms (Agormedah et al., 2024). These results are consistent with prior studies in the field.

The study's results also reveal that an increase in distress is associated with a decrease in academic success. This is consistent with prior research, which similarly indicates that as distress intensifies, academic success diminishes (Anyanwu, 2023). Additionally, numerous studies highlight the adverse effects of distress on the mental health of adolescents, further aligning with the present research outcomes. Distress is typically associated with negative emotions, such as anger, frustration, disappointment, and deception (Geng et al., 2020; Kopp, 1989), whereas well-being is characterized by the frequent experience of positive emotions over negative ones (Geng et al., 2020). Thus, the finding that distress behaviors, often driven by negative emotions, contribute to a decline in academic success.

A final key finding of this study is that distress partially mediates the relationship between aggression and academic success. Although no studies directly investigate this specific relationship, existing literature provides supporting evidence. Prior research has established a positive correlation between distress and aggression (Deng et al., 2024; Chabbouh, 2023), a negative association between aggression and academic success (Vuoksima et al., 2020; Uludag, 2013), and a negative relationship between distress and academic success (Anyanwu, 2023). Taken together, these findings lend credence to the present study's conclusion regarding the mediating role of distress. In other words, the study's results, which suggest that aggression negatively impacts academic success by increasing distress, are in alignment with previous research.

LIMITATIONS

As with any research, this study is not without its limitations. The use of a convenience sampling method, while practical for the research objectives, introduces certain constraints. Given that the participants were drawn from schools in Baku, the findings may not be generalizable to schools in other geographic regions or to students with different demographic characteristics. Furthermore, the data collection employed a cross-sectional design, capturing information at a single point in time. To establish causal relationships, a longitudinal study spanning a longer duration would be necessary. Third, the study did not assess test-retest reliability. Fourth limitation, the participants in this study were school students without clinical characteristics, which means the results may be applicable only to certain segments of the population.

CONCLUSION

In this study, we examined the relationship between aggression, psychological distress, and academic achievement among adolescents in Azerbaijan schools. The findings revealed an interaction between aggression and academic success in this population. Specifically, aggression was found to mediate the relationship between academic success and distress. In other words, higher levels of aggression in adolescents are associated with increased distress, which in turn negatively impacts their academic performance.

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