



Dark Tetrad Personality Traits: An Analysis by Gender in Aggressors and Victims of School Bullying

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Abstract

The present study was designed with the purpose of contributing to the existing scientific literature about the presence of Dark Tetrad personality traits—Machiavellianism, psychopathy, narcissism, and sadism—in aggressors and victims of school bullying, also taking into account the possible gender differences in both roles. The results, obtained by means of the Two-Way Multivariate Analysis of Variance, with a sample of participants made up of 2977 adolescents and aged between 11 and 17, indicated that adolescents with a higher participation in bullying behaviors and those that are highly victimized, obtained higher scores in the four Dark Tetrad traits. By gender, boys displayed higher scores in sadism, both in the bullying and victimization model. In addition, two interactions between victimization and gender were identified: Victimization was associated with higher comparative levels of Machiavellianism and narcissism in boys than in girls. These results suggest the need to include the study of these components of personality and gender in the understanding, prevention, and intervention in school bullying situations among adolescents.

Keywords Adolescence · Personality traits · Dark Tetrad · Bullying · Gender

Introduction

School violence encompasses a broad spectrum of behaviors, including aggression among students, violence directed toward teachers, and acts of vandalism occurring within the educational environment (Espelage et al., 2013). Within this broader context, traditional school bullying is characterized by repeated and intentional aggressive behavior—physical, verbal, or relational in nature—perpetrated by one or more individuals against a peer, within a context of power imbalance and domination (Garaigordobil & Machimbarrena, 2019; Olweus, 2013; World Health Organization [WHO], 2018). Traditional bullying is thus conceptualized as a specific form of school violence: A type of peer harassment that is increasingly present in classrooms, particularly among adolescents, as highlighted by data from international

organizations such as the World Health Organization, International Bullying Without Borders, and other cross-cultural studies (Sorrentino et al., 2019).

According to the latest report issued by UNESCO (Bridges & Walls, 2018), one in three students (32%) claims to have been bullied by their classmates at school at least once in the last month. The study by Elgar et al. (2015), which includes the largest number of countries analyzed on prevalence on this topic, collecting data from 79 countries, also indicated that around 30% of adolescents has experienced bullying situations. Regarding gender differences, a recent study by Biswas et al. (2022), based on samples from 40 countries, found a similar prevalence of victimization among boys and girls: 8.8% of boys and 7.4% of girls reported having been bullied. However, the forms of bullying tend to differ by gender. Boys are more likely to engage in direct forms of aggression, such as physical and verbal bullying, while girls are more often involved in relational forms of bullying, including social exclusion, rumor spreading, and manipulation of peer relationships (Useche et al., 2023; Kim et al., 2023).

Rates are really worrying bearing in mind the serious negative consequences, on occasions devastating, that this kind of abuse among peers has on the victims (Estévez et al.,

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2018; Jenkins et al., 2023), with clear negative direct effects on children's physical health, academic performance, emotional well-being (Bettencourt et al., 2023), and even suicidal behaviors (Buelga et al., 2022).

Numerous research studies have tried to identify the root causes of school bullying, as well as the vulnerability factors both in victims and aggressors, but this research has mainly focused on psychoemotional and psychosocial or contextual factors (Cross et al., 2019; Estévez-García et al., 2023; Fredrick & Jenkins, 2023; Leemis et al., 2019; Qian et al., 2020). Thus, among the key risk factors contributing to victimization, there is consensus to consider the following as relevant: excessive shyness and introversion, lack of social abilities, social anxiety, low group acceptance, low self-esteem, and particular characteristics related to physical appearance or learning difficulties (Bryson et al., 2021; Cañas et al., 2020; Fuentes Chacón et al., 2019; León-Moreno et al., 2019; Méndez et al., 2017). With respect to aggressors implied in school bullying, research has identified a variety of family risk factors (Estévez et al., 2018; Martínez-Ferrer & Moreno, 2017) as well as other elements associated to difficulties to control the impulses, low empathic ability, and more probability to show addition to substances and new technologies (Crespo, Romero et al., 2017; Falla et al., 2021; Valdés, et al., 2018). Beyond these variables, there is a very emerging and incipient scientific literature analyzing the role of personality traits that are ingraining in adolescents, in the better understanding of bullying dynamics (Zhang & Zhu, 2021).

Bullying and Personality Factors

The research carried out on the connection between peer bullying and personality factors is mainly based on the study of regulatory traits, such as the Big 5 Model by Costa and McCrae (1992). The meta-analysis carried out by Mitsopoulou and Giovazolias (2015) demonstrated that low levels of agreeableness, openness to experience, and conscientiousness, as well as higher levels of extraversion and neuroticism, were related to a higher probability of displaying violent and abusive behaviors, a result which was confirmed in the subsequent studies by Pronk et al. (2017) and by de Volk et al. (2018). The latter also corroborated the association between the extroversion factor and victimization, indicating that adolescents with lower scores in this trait are more likely to be bullied.

Yet, there is a personality model which includes a series of traits more directly linked to antisocial, criminal, and violent behaviors, elaborating on the results extracted from the general personality models (Marcus, Preszler, & Zeigler-Hill, 2018; Pineda et al., 2022). The traits included in this model are known as the *Dark Triad of Personality*, and were first described by Paulhus and Williams (2002) and

coined as Machiavellianism, psychopathy, and narcissism. Following the definitions provided by the original authors, and Jones and Paulhus (2014), *Machiavellianism* is characterized by a strategic and manipulative approach to social interactions and by the lack of morality and genuine concern for the well-being of others; *psychopathy* refers to a pattern of insensitivity, impulsiveness, and a lack of empathy; and *narcissism* makes reference to a magnificent sense of identity, to the overvaluation of personal importance, and to the need for social admiration (Jones & Paulhus, 2014). While delving into the research on this field, a fourth trait called *sadism* was included, which reformulated the name of the model to the *Dark Tetrad of Personality*. *Sadism* is characterized by the tendency to enjoy the suffering of others and to take pleasure when inflicting pain on or humiliating them (Chabrol et al., 2009; O'Meara et al., 2011).

Dark Tetrad Traits in Aggressors

The specific research on the presence of these personality traits in relation to school bullying is very recent in the scientific literature, dating back to the last decade and focusing on the specific role of the bully (Goodboy & Martin, 2015). For instance, some studies have shown that students with high levels of Machiavellianism are more likely to get involved in aggressive and intimidating behaviors with other schoolmates (Jones & Neria, 2015; Jones & Paulhus, 2010), standing out as manipulative and strategic leaders who want to control others (Hyland et al., 2014; Peeters et al., 2010). These adolescents have much more difficulty understanding others' emotions, which makes them less likely to recognize the damage they are causing to the victim and to feel remorse for their actions (Massey-Abernathy & Byrd-Craven, 2016).

Regarding psychopathy, Gul-E-Sehar and Iram (2016) confirmed the presence of psychopathic traits in school aggressors, and other studies have observed that the combination of psychopathy and violence is emphasized if the levels of sadism are also high (Porter & Woodworth, 2006), thus increasing the probability of participating as a bully in abuse situations. In fact, sadism is considered by some authors as the most antisocial trait of aggressors (van Geel et al., 2017a). In the case of bullies, high scores of sadism may be related to their need to feel power and control toward the victim just for the pleasure to see the suffering (Wendt et al., 2019). However, not all aggressors display sadistic traits, and not every person with sadistic traits is a bully, even though the presence of sadistic traits appears to indicate a more serious bullying behavior, especially because it implies a proactive behavior to harm, unlike other personal variables (e.g., impulsivity), more associated with reactive aggressions (Duan et al., 2021).

Regarding narcissism, studies have shown that narcissist people are, in general, more likely to get involved in

behaviors like cheating, lying, or participating in risk behaviors (Alavi et al., 2023; Jonason & Webster, 2010), as well as displaying aggressive tendencies in their behavior (Kjærviik & Bushman, 2021; Zhang & Zhu, 2021). The research by Bonfá-Araujo et al. (2023) with students indicated that those with high scores of narcissism tended to orient themselves toward values of self-promotion, prioritizing their interests over those of others, and actively looking for situations in which they can gain power and status. Narcissism has also been related to the specific behavior of aggression in school bullies (Ang et al., 2010). More recently, van Geel et al. (2017b) carried out a meta-analysis to reviewed personality traits in aggressors concluding that those with high levels of narcissism are more likely to become bullies.

Dark Tetrad Traits in Victims

Research so far is much more limited regarding the presence of Dark Tetrad traits in victims, particularly in adolescents exposed to school bullying. Most existing studies have been conducted with general population samples and suggest that individuals with high levels of narcissism may be more likely to perceive themselves as victims of interpersonal transgressions due to cognitive biases in memory and self-representation (Ok et al., 2020). Fanti and Kimonis (2012) also pointed out that narcissists are prone to interpreting situations as ego-threatening, leading them to perceive themselves as targets of others' contempt. Ok et al. (2020) further found that individuals high in narcissism and Machiavellianism were more likely to feel morally superior and publicly express victimization in ways that may serve social status regulation, which in turn predicted a greater likelihood of engaging in ethically questionable behavior (e.g., exaggerating harm and dishonesty for gain). Although these studies do not focus on school bullying, they suggest that dark personality traits can shape how individuals experience and respond to interpersonal harm.

In childhood and adolescence, more recent research has linked psychopathy to experiences of victimization and peer mistreatment. Psychopathy has been associated with early dysfunction in brain regions involved in empathy and emotional processing (Blair, 2013), which may contribute to difficulties in interpreting social cues and responding appropriately (Jones & Paulhus, 2010; Marsh & Blair, 2008), thereby increasing the likelihood of peer rejection and victimization. Consistently, Boccio and Beaver (2021), in a longitudinal study with adults, observed that interpersonal traits associated with psychopathy increased the probability of being victimized, suggesting that certain affective and interpersonal styles may provoke negative social responses. Similar patterns have been reported for individuals high in sadism, whose behavior may elicit hostility and rejection (Chester et al., 2019). These findings provide a conceptual

basis for exploring dark traits not only in aggressors, but also in victims.

However, none of these studies directly examine victimized adolescents in school bullying contexts. Only four studies have addressed this population so far. Three found positive correlations between psychopathy and victimization when analyzed individually (Despoti et al., 2021; Gul-E-Sehar & Iram, 2016), and one—by Pineda et al. (2022)—examined all four Dark Tetrad traits in 393 adolescent victims, identifying psychopathy and sadism (and to a lesser extent Machiavellianism) as significant predictors of victimization risk. Nonetheless, that study used a relatively small sample and did not examine gender differences. Building on these insights, and considering prior evidence of gender differences in the expression of dark traits (Chester et al., 2019; Montero-Carretero et al., 2021), we formulated directional hypotheses, expecting that higher levels of victimization would be associated with higher scores in psychopathy and sadism, particularly among boys.

Gender and Dark Tetrad Traits

Some studies suggest that traits associated to the Dark Tetrad are expressed differently in men than in women (Blötner et al., 2023; Forouzan et al., 2005; Green et al., 2024; Hartung et al., 2022), mostly indicating that women consistently obtain lower general levels of socially aversive personality dispositions, while men exhibit higher scores on each measurement of the Dark Tetrad scales. But the mentioned studies have focused on general and adult population, some of them more deeply focusing in a particular personality trait. For example, some works have point out that men display higher levels of Machiavellianism than women (Andrew et al., 2008; Collison et al., 2021; Klimstra, Jeronimus, Sijtsma, & Denissen, 2020). Regarding psychopathy, in the studies by Knight et al. (2018) and Dinić and Wertag (2018) with young adult population, they observed high aggressive tendencies in those men with high scores in this personality trait. Other studies have pointed out that boys are more likely to display sadistic behaviors than girls (Perenc & Radochonski, 2014; Pfattheicher et al., 2023; Wendt et al., 2019).

Thus, even though there is some evidence that the Tetrad traits may develop in a different way between genders, we have no conclusive references in relation to bullying behaviors among peers in the school context, which is one of the purposes of the present study.

The Present Study

As just pointed out, most previous studies have analyzed *dark personality* in aggressors, while dodging an in-depth study of the possible presence of these characteristics in victims of school bullying in adolescence. Knowing these

distinctive features will allow professionals to design specific prevention and intervention programmes which include personality factors which may lead to situations of mistreatment among peers. Not to mention the lack of studies that include the analysis of the four traits in boys and girls, in the roles of aggressor and victim. To fill this gap, the main goal of the present study was to assess the relationship between the four Dark Tetrad personality traits—Machiavellianism, psychopathy, narcissism, and sadism—in the roles of bully and victim of school bullying, also taking into account the possible gender differences.

The following four specific objectives were established: (1) to examine whether there are any differences in the dimensions of Narcissism, Machiavellianism, Psychopathy, and Sadism in adolescent bullies according to the levels of aggression in the school; (2) to analyze whether there are any gender differences among the bullies in the dimensions of the Dark Tetrad; (3) to assess whether there are any differences in the four dimensions of the Dark Tetrad in adolescents according to the levels of victimization in the school; (4) to analyze whether there are any gender differences among the victims in the variables of the Dark Tetrad.

Building on existing research, the following four hypotheses were established: (H1) adolescents with a higher level of aggression will obtain higher scores in the four dimensions of the Dark Tetrad; (H2) male bullies will obtain higher scores in the dimensions of the Dark Tetrad in comparison with girls; (H3) highly victimized adolescents will obtain higher scores in the four dimensions of the Dark Tetrad; (H4) victimized boys will obtain higher scores in the dimensions of the Dark Tetrad in comparison with girls.

Material and Methods

Participants

Analyses of the present study are mainly based on data from a representative sample of Spanish secondary school students who were recruited through random cluster sampling in 7 high schools located in the geographical areas of the Valencian Community, Aragon, and Andalusia. The primary sampling units were the urban geographic areas of the three communities. The secondary units were the public and private secondary schools in each area. Classrooms were not considered tertiary units, as all levels from first to fourth grade of the selected schools were included in the study. A series of preliminary analyses of differences in means was conducted with the target variables of the study according to the school's location and its public/private condition, without finding any statistically significant differences. The total sample comprised 2977 adolescents (48.5% boys), whose ages ranged from 11 to 17 ($M = 14.1$, $SD = 1.42$). Students

were equally distributed by academic level: 24.5% in the first year, 26.6% in the second year, 24.4% in the third year, and 24.5% in the fourth year of Compulsory Secondary Education, of the Spanish education system.

Measures

School Bullying. The *Peer Harassment Screening* (Garaigordobil, 2013) was used to measure bullying and victimization at school. This instrument comprises 8 items which provide measurements of physical, verbal, social, and psychological aggression among peers with a four-point Likert type scale which goes from 0 (never) to 3 (always). Participants fill in the items twice, from the perspective of aggressors and victims separately. The internal consistency of the global scale measured by means of the Cronbach's alpha was 0.82, and for the dimensions was 0.83 for victimization, and 0.79 for bullying in the present sample.

Dark Tetrad of Personality. Two scales were used to measure this construct. On the one hand, the Dirty Dozen (DD) by Jonason and Webster (2010), in the Spanish adaptation of Pineda, Sandin and Muris (2020). This instrument comprises 12 items which measure three dimensions: Machiavellianism (e.g., "You need to wait for the right moment to take revenge on people"), psychopathy (e.g., "Revenge must be fast and unpleasant"), and narcissism (e.g., "I insist on earning the respect I deserve"). The data were collected using a Likert type scale between 1 (I totally disagree) and 7 (I totally agree). For the full scale, Cronbach's alpha in the present study was 0.85. For each of the subscales, Cronbach's alpha values were as follows: Machiavellianism 0.82, psychopathy 0.70, and narcissism 0.84. To get a measure of sadism, the Assessment of Sadistic Personality (ASP) by Plouffe, Saklofske, and Smith (2017) was used, in the Spanish adaptation of Pineda et al. (2020). This instrument comprises 9 items that provide a general measurement of sadism (e.g., "I think of hurting the people who annoy me") in a 7 Likert scale that rated from 1 (I totally disagree) to 7 (I totally agree). Cronbach's alpha for this scale in the present sample was 0.87.

Procedure

Data for this research were collected as part of a larger study on school bullying and suicidal ideation in adolescents in Spain, after gaining the approval of the corresponding research ethics committees of each participating university (project evaluation committee Reference: DPS.ESL.01.19). It also complies with the ethical values required in research with human beings and respects the fundamental principles included in the Helsinki Declaration. A letter with a summary of the research project was sent to the participating schools as a first step. Subsequently, initial telephone contact

with the school headmasters was established, followed by a briefing with all the teaching staff in each school, informing of the objectives and methodology of the study in a 2-h presentation. In parallel, a letter describing the study was sent to the parents, requesting them to indicate in writing if they did not wish their child to participate (1% of parents used this option). Passive consent was received from the rest of the parents.

The administration of the instruments was carried out by a group of trained and expert researchers in each region. Before data collection, students also attended a short briefing in which they provided written consent and were informed that they could withdraw from the study at any time during the process. On the dates scheduled with the teaching staff, participants voluntarily and anonymously filled out the online scales through the use of mobile devices provided by researchers. Data completion was carried out in their respective classrooms during a regular class period of about 45 min. Expert researchers remain in the classrooms during the data collection to respond doubts and supervise the completion of the scales.

Data Analysis

First, an exploratory analysis was performed to determine the adequacy of the data for the present study. Missing values, ranging between 2.7 and 4.6%, were identified in bullying, victimization, and dark traits. In terms of efficiency and consistency, previous simulation studies have not found biases or practical implications when using percentages of missing data lower than 5% (Drechsler, 2015). Missing values were imputed using the regression method at the item level (Gottschall et al., 2012). Subsequently, univariate outliers were detected by examining standardized scores with an absolute value greater than 4 and using Box and Whiskers plots (Hair et al., 2016). The Mahalanobis distance was calculated for multivariate detection purposes. A multivariate outlier is identified if the probability associated with a Mahalanobis distance is 0.001 or less (Tabachnick & Fidell, 2013). A total of 51 multivariate outliers were removed, resulting in a final sample size of 2,926 adolescents.

After conducting exploratory analyses, a correlation analysis was performed to evaluate the relationship between the different variables in the study. Subsequently, a cluster analysis was conducted based on the assumption of maximum intragroup homogeneity and maximum intergroup heterogeneity, aiming to identify groups of adolescents characterized by low or high levels of victimization and bullying based on their responses to the scale items. (Musitu-Ferrer et al., 2019). Specifically, to obtain homogeneous victimization and bullying groups, k-medians were used (Everitt et al., 2011). To obtain an optimal number of groups, the “cluster stop” command with solutions from 2 to 6 clusters was used

in Stata 17 (StataCorp, 2021). In Stata, the ‘cluster stop’ command utilizes the Calinski–Harabasz pseudo-F index as a stopping criterion, where larger values signify more distinct and optimally separated clusters (Caliński & Harabasz, 1974; Duda et al., 2007; Everitt et al., 2011). Afterward, the mean and standard deviations of the sum of items from the bullying scale were estimated to assess the differences among the identified clusters. The same procedure was used for the victimization clusters.

Additionally, two factorial (2×2) multivariate analysis of variance (MANOVA) were applied. In model 1, bullying (low vs. high) and gender (boys vs. girls) were used as independent variables. In model 2, victimization (low vs. high) and gender were used as independent variables. In both analyses, the four dimensions of the Dark Tetrad (Machiavellianism, psychopathy, narcissism, and sadism) were considered dependent variables.

Within the different multivariate criteria, to study the effects of independent variables, the Pillai’s criteria were selected, since they are the most robust ones for violations of statistical assumptions (Tabachnick & Fidell, 2013). The effect sizes for MANOVA results were estimated with partial eta-squared (η^2). Cohen’s effect size cutoffs criteria were used for descriptive ends: 0.01, 0.06, and 0.14, for small, medium, and big effects, respectively (Ellis, 2010). Follow-up ANOVAs were conducted for all sources of variations when multivariate statistically significant differences reached the significant statistical level.

Results

First of all, the correlations between the variables of the study were calculated (Table 1). The correlations showed the expected tendency. In the case of girls, the highest value was observed between Machiavellianism and narcissism ($r=0.52$ [0.48, 0.56]) whereas, in the case of boys, between Machiavellianism and psychopathy ($r=0.51$ [0.47, 0.55]).

Cluster Analysis: Bullying and Victimization Groups (Low Versus High)

The results of the cluster analysis revealed the existence of two groups of bullying. Cluster 1 included adolescents who displayed no or low aggression, 54% of whom were girls. Cluster 1, made up of 2411 individuals, included 100% of adolescents who had never bullied anyone and 63.3% of adolescents with a mean level of aggression close to zero (1.41). Cluster 2 was made up of 515 adolescents with aggressive behavior and a higher mean than Cluster 1 (4.63). 60% of this group was composed of boys. In this cluster, some adolescents managed to reach means in the maximum threshold of aggression (12 pts). After analyzing the means of the

Table 1 Pearson correlations, means, and standard deviations of the study variables, stratified by gender

Variables	1	2	3	4	5	6
1 Bullying	–	.42 [.38, .46]	.31 [.26, .35]	.33 [.29, .38]	.25 [.20, .30]	.30 [.25, .34]
2 Victimization	.46 [.42, .50]	–	.14 [.09, .19]	.12 [.07, .17]	.13 [.08, .18]	.10 [.05, .15]
3 Machiavellianism	.36 [.32, .41]	.22 [.17, .26]	–	.48 [.44, .52]	.52 [.48, .56]	.39 [.34, .43]
4 Psychopathy	.31 [.26, .35]	.15 [.10, .20]	.51 [.47, .55]	–	.33 [.29, .38]	.37 [.32, .41]
5 Narcissism	.27 [.22, .31]	.25 [.20, .30]	.47 [.43, .51]	.36 [.31, .40]	–	.29 [.25, .34]
6 Sadism	.32 [.27, .36]	.12 [.07, .17]	.42 [.38, .46]	.40 [.35, .44]	.27 [.22, .32]	–

The lower triangle shows the correlation coefficients in boys ($n=1445$), and the upper one in girls ($n=1532$). Values in square brackets are 95% confidence intervals for the correlations

four indicators of bullying through t test for independent samples (independent samples t test) and bootstrapping with $n=1000$ (bootstrapping with $n=1000$), Cluster 1 showed lower levels of aggression with a statistically significant difference in means (Mdiff) in the four dimensions of aggression: physical (Mdiff = -0.93 [95%CI (-1.01 ; -0.87)]), verbal (Mdiff = -1.44 [95%CI (-1.51 ; -1.38)]), social (Mdiff = -0.92 [95%CI (-0.98 ; -0.86)]), and psychological (Mdiff = -0.81 [95%CI (-0.88 ; -0.74)]).

In addition, the cluster analysis also revealed the existence of two groups related to school victimization. Cluster 1, composed of 2282 adolescents, included students with no or low victimization. Within this cluster, we find 100% of adolescents who were never victims and 70.0% of those who were, but with a very low mean level (2.65 in a range between 0 and 12). Cluster 2, in turn, was composed of 644 adolescents with a high mean victimization rate (8.00), and with a minimum score of 5 and a maximum of 12 in a total range between 0 and 12. The analysis of the means of the indicators of victimization through t test for independent samples and bootstrapping with $n=1000$ pointed out that Cluster 1 presented lower levels of physical (Mdiff = -0.94 [95%CI (-1.02 ; -0.86)]), verbal (Mdiff = -1.78 [95%CI (-1.83 ; -1.72)]), social (Mdiff = -1.53 [95%CI (-1.60 ; -1.44)]), and psychological (Mdiff = -1.88 [95%CI (-1.95 ; -1.82)]) victimization. These clusters were used in the following analyses so as to corroborate the hypotheses of the study.

Multivariate Analysis

A 2×2 multivariate factor analysis (MANOVA) was conducted, which revealed a significant main effect of bullying with a medium effect size (Pillai's Trace = 0.122, [F(4, 2919) = 101.84], $p < 0.001$, $\eta^2 = 0.12$). Gender also showed

a significant main effect (Pillai's Trace = 0.012, [F(4, 2919) = 8.75, $\eta^2 = 0.01$], $p < 0.001$). These results indicated that both bullying and gender were independently related to the Dark Tetrad as independent variables through main effects.

The second model yielded significant main effects of victimization, (Pillai's Trace = 0.026, [F(4, 2919) = 19.19], $p < 0.001$, $\eta^2 = 0.026$), and gender (Pillai's Trace = 0.017, [F(4, 2919) = 12.33], $p < 0.001$, $\eta^2 = 0.017$), as well as an interaction effect between victimization and gender, (Pillai's Trace = 0.004, [F(4, 2919) = 3.01], $p = 0.017$, $\eta^2 = 0.004$). These results indicated a statistical association between victimization and Dark Tetrad, and between gender and Dark Tetrad, as well as the existence of gender differences in the relationship between victimization and dark personality traits. This information is presented in Table 2.

Univariate Analysis

Model 1. Results by Bullying and Gender

The results of the Follow-up Analyses of Variance (ANOVA) confirmed the existence of significant differences in the four variables of the Dark Tetrad, depending on the level of aggression of adolescents, with a medium effect in the case of Machiavellianism (F(1, 2922) = 279.82, $p < 0.001$, $\eta^2 = 0.087$) and psychopathy (F(1, 2922) = 251.84, $p < 0.001$, $\eta^2 = 0.079$) and with smaller effects in the case of narcissism and sadism (Table 3). By gender, a significant difference was found out in relation to sadism (F(1, 2922) = 26.25, $p < 0.001$, $\eta^2 = 0.010$).

As stated in Table 4, the cluster of adolescents with high aggression, considering both genders, displayed higher scores in Machiavellianism (2.70 vs. 1.84), psychopathy

Table 2 2×2 Factorial MANOVAs for Machiavellianism, psychopathy, narcissism, and sadism

Pillai's						
Source of variation	Trace	<i>F</i>	<i>g</i> /between	<i>g</i> /error	<i>p</i>	η^2
<i>Model: aggression (A)</i>						
Aggression	.122	101.84	4	2919	< .001	.122
(B) Gender	.012	8.75	4	2919	< .001	.012
A x B	.002	1.59	4	2919	.174	.002
<i>Model: victimization(C)</i>						
Victimization	.026	19.19	4	2919	< .001	.026
(D) Gender	.017	12.33	4	2919	< .001	.017
C x D	.004	3.01	4	2919	.017	.004

Table 3 Model 1. Follow-up ANOVAs of Bullying Aggression, Gender, and the interaction on the four dimensions of The Dark Tetrad

Variables	Aggression			Gender			Aggression * gender		
	<i>F</i> (1,2922)	<i>p</i>	η^2	<i>F</i> (1,2922)	<i>p</i>	η^2	<i>F</i> (1,2922)	<i>p</i>	η^2
Machiavellianism	279.82	< .001	.087	1.06	.303	.000	2.04	.154	.001
Psychopathy	251.84	< .001	.079	.059	.808	.000	.69	.405	.000
Narcissism	148.77	< .001	.048	.695	.405	.000	.56	.454	.000
Sadism	141.55	< .001	.046	26.25	< .001	.010	1.78	.183	.001

Table 4 Means and standard deviations for the four variables of the Dark Tetrad according to the levels of aggression and victimization by gender

Variables	Aggression						Victimization						Total by gender		Total by
	Low aggression			High aggression			Low victimization			High victimization					Dark Trait
	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	
Machiavellianism	1.77 (0.97)	1.89 (1.05)	1.84 (1.01)	2.71 (1.24)	2.69 (1.19)	2.70 (1.22)	1.90 (1.05)	1.94 (1.09)	1.92 (1.07)	2.35 (1.26)	2.18 (1.13)	2.24 (1.19)	1.97 (1.10)	2.00 (1.10)	1.99 (1.10)
Psychopathy	2.03 (1.01)	1.98 (1.01)	2.00 (1.01)	2.80 (1.13)	2.83 (1.21)	2.81 (1.16)	2.14 (1.04)	2.04 (1.05)	2.10 (1.04)	2.47 (1.24)	2.23 (1.15)	2.32 (1.19)	2.20 (1.08)	2.09 (1.08)	2.15 (1.08)
Narcissism	2.43 (1.34)	2.42 (1.39)	2.42 (1.37)	3.31 (1.38)	3.20 (1.46)	3.26 (1.41)	2.50 (1.34)	2.45 (1.4)	2.47 (1.37)	3.22 (1.53)	2.75 (1.48)	2.92 (1.51)	2.62 (1.40)	2.53 (1.43)	2.57 (1.41)
Sadism	1.63 (0.74)	1.49 (0.69)	1.55 (0.72)	2.12 (0.94)	1.88 (0.85)	2.02 (0.91)	1.71 (0.8)	1.51 (0.71)	1.62 (0.77)	1.84 (0.87)	1.62 (0.75)	1.70 (0.81)	1.73 (0.81)	1.54 (0.72)	1.63 (0.77)

Table 5 Model 2. Follow-up ANOVAs of Bullying Victimization, Gender, and the interaction on the four dimensions of The Dark Tetrad

Variables	Victimization			Gender			Victimization * Gender		
	<i>F</i> (1,2922)	<i>p</i>	η^2	<i>F</i> (1,2922)	<i>p</i>	η^2	<i>F</i> (1,2922)	<i>p</i>	η^2
Machiavellianism	46.53	< .001	.016	1.67	.196	.001	4.631	< .05	.002
Psychopathy	27.18	< .001	.009	12.04	< .001	.004	2.041	.153	.001
Narcissism	63.4	< .001	.021	16.58	< .001	.006	10.589	< .01	.004
Sadism	11.22	< .001	.004	34.78	< .001	.012	0.02	.890	.000

(2.81 vs. 2.00), narcissism (3.26 vs. 2.42), and sadism (2.02 vs. 1.55). By gender, the results indicated that boys had significantly higher scores in sadism, regardless of the level of bullying.

Model 2. Results by Victimization and Gender

The results indicated that the high-victimization cluster obtained significantly higher general means in all the variables of the Dark Tetrad (see Table 5), with the boys

displaying higher scores in all of them at any level of victimization. Besides, the results of the Follow-up ANOVAs for model 2 confirmed the existence of two interactions between victimization and gender. One of them was related to Machiavellianism ($F(1, 2922) = 4.63, p < 0.05, \eta^2 = 0.002$) (Table 5 and Fig. 1). Both genders obtained similar scores in Machiavellianism in the low victimization group, and both obtained significantly higher scores in the high victimization group. However, the increase in the score of Machiavellianism in highly victimized boys was significantly more pronounced than in the girls, which indicated that the relationship between victimization and Machiavellianism was especially stronger in the case of boys.

To summarize the results of both models, the Dark Tetrad traits were mainly associated with the role of the bully, although there were also differences between those traits depending on the level of victimization. The variable of gender carried a lot of weight to understand the level of the Dark Tetrad in the role of the victim, where some interactions between gender and victimization were observed.

Discussion

This study sought to contribute to the scant literature on the Dark Tetrad in aggressors and victims of school bullying among adolescents, also taking into account the possible gender differences in both roles. In view of the results obtained, and confirming what was postulated in the initial first hypothesis, adolescents with a greater involvement in bullying behaviors displayed higher scores in the four dimensions of the Dark Tetrad.

More precisely, Machiavellianism and psychopathy were the variables which showed a more differentiated behavior, with significantly higher values in the high-aggression group, compared to the low-aggression one, in line with other previous studies (Jones & Neria, 2015; Jones & Paulhus, 2010; Porter & Woodworth, 2006). This direct close relationship between Machiavellianism and psychopathy had been confirmed in violent people (Baughman et al., 2012), who are more likely to harm others intentionally as a result of a lack of empathy which emotionally separates them from the suffering of the victim (Perenc & Radochonski, 2014; Wendt et al., 2019). In their recent meta-analysis, Gillespie et al. (2023) identified convincing evidence of the positive association between psychopathy and general recidivism in violent and intimidating behaviors, both in reactive and proactive acts of aggression, even though this trait is specifically associated with the proactive aggression (Ragatz et al., 2011), which is more typical of the profile of the bully.

The results obtained in the present study also showed that the high-aggression group obtained significantly higher scores in sadism and narcissism than the low-aggression group. These results reinforce the conclusion of the research carried out by van Geel et al. (2017a) with school aggressors, who identified narcissism and, above all, sadism as a very powerful predictor of antisocial behaviors during adolescence and, in particular, of bullying and even cyberbullying behaviors.

With respect to narcissism, different studies have indicated the close association between the narcissism and aggression on general population, such as the meta-analytic review by Kjærviik and Bushman (2021) or the study by Bonfá-Araujo et al. (2023) with university students.

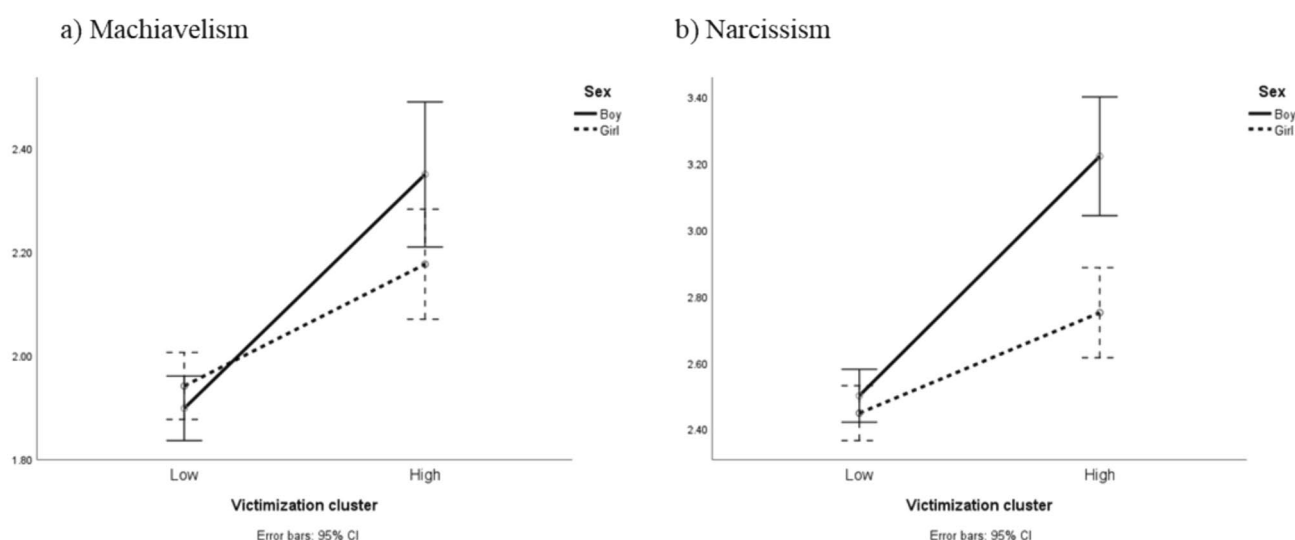


Fig. 1 Marginal Means Estimated for the interactions between bullying Aggression, Victimization and Gender for **a** Machiavellianism; **b** Narcissism. Notes: Vertical bars represent 95% confidence intervals

ZeiglerHill & Besser (2013) hold that the relationship between narcissism and aggression might be related to the fact that narcissists mask their low self-esteem with a heightened sense of self, and the need to defend their ego. This is an interpretation which derives from our results with an adolescent sample by analyzing the Tetrad as a whole. When the narcissist trait co-exists with the other three (Machiavellianism, psychopathy, and sadism), we find individuals who perfectly fit the profile of aggressor or bully, as an individual with a marked ego who needs to humiliate a peer with the purpose—and pleasure—of causing damage (proactive violence) and obtaining a social status within the peer group, without displaying remorse. As pointed out by Ang et al. (2010), the narcissist believes in the legitimacy of the aggression if it benefits themselves, as it is the case.

Regarding the second hypothesis, which set out a more marked presence of dark traits in male bullies than in females, our results suggested that gender does not play a generalized significant role in this sense. Since boys and girls with a high level of aggressive behavior did not show significant differences in Machiavellianism, psychopathy, and narcissism, it was not possible to generalize about a more noticeable dark personality in boys. Sadism did make a difference since boys obtained significantly higher values in this trait, regardless of their degree (high or low) of involvement as bullies. This result coincides with the one indicated in the recent study by Pfattheicher et al. (2023) with schoolchildren, who concluded that gender was a significant predictor of sadism in the case of boys.

As well as in the case of aggressors, the victims also showed a greater presence of the four Dark Tetrad traits as their degree of victimization increased, thus confirming what was stipulated in the third hypothesis. In addition, as expected in the fourth hypothesis, victimized boys did show, in general, a more noticeable dark personality than girls. Highly victimized adolescents reached a higher mean level both in psychopathy and sadism, regardless of their gender; but, on the other hand, boys obtained the highest levels in psychopathy and sadism in comparison with girls, irrespective of the degree of victimization. These results confirm the ones observed by Pineda et al. (2022) with a sample of 393 adolescents, who informed of the high predictive value of these two particular traits in the probability of being victimized at school.

This association may be explained by a behavioral shift in some children and adolescents who are repeatedly bullied and mistreated by their peers, leading them to adopt more hostile, detached, or contemptuous modes of social interaction. These behaviors may reflect psychopathic tendencies—such as emotional coldness, lack of empathy, or moral disengagement—as a form of psychological adaptation or defense. Over time, such interpersonal styles may further deteriorate peer relationships, reinforcing social rejection

and increasing the risk of continued victimization. This notion is consistent with the findings of Boccio and Beaver (2021), who, in a longitudinal study with a general adult population, found that psychopathic traits were significantly associated with a higher risk of personal victimization. They argued that individuals with elevated levels of negative interpersonal and affective traits—such as callousness, superficial charm, or manipulateness—are more likely to provoke adverse reactions in others, making them more vulnerable to violence and other forms of aggression.

The present study makes a significant contribution to these conclusions by confirming that the link between victimization among adolescents and psychopathic and sadistic dark personality traits is stronger in the case of boys. This unexplored aspect needs to be analyzed in more detail, but in line with what was observed in studies on school bullying and moral disengagement, as pointed out for instance in the systematic review carried out by Gómez-Tabares and Correa Duque (2022), who concluded that moral disengagement and distance were stronger in the case of boys involved in bullying situations, compared to girls.

The relationship between victimization and gender turned out to be really interesting in the case of the two Tetrad traits in which we observe significant interactions in the analysis of variance: Machiavellianism and narcissism. With respect to Machiavellianism, even though the mean score of both genders increased in the group of highly victimized adolescents, that increase was significantly higher in boys. The association between males and higher levels of Machiavellianism had been corroborated in other studies with a general population of adults (Collison et al., 2021; Szabó & Jones, 2019), but the results of the present study identified that this association might be significantly related, at least in part, to experiences of victimization in a school population. Therefore, Pineda et al. (2022) stressed the correlation between being a victim of school bullying and Machiavellian traits, but the findings of the present research allow us to understand that this link is stronger in the case of boys, in whom this personality trait increases in proportion to the victimization experience. A possible explanation to this fact, which would need to be explored in future research studies, is that intense and extended victimization provides boys with the increasing need to develop a strategic approach in their social interactions. These would become colder and more distant and manipulative, as a result of a generalized distrust of others caused by their experience of social mistreatment. Although the recent research on the revenge by victims of bullying clearly supports this interpretative hypothesis (León-Moreno et al., 2019; Watson et al., 2021), we have not managed to find any references in the literature to gender differences in victims of school bullying.

Narcissism has also displayed a marked interaction between victimization and gender: Adolescents with low

victimization obtained similar levels in this personality trait. Yet, in the high-victimization group, the degree of narcissism in boys was significantly different from the one estimated in girls. Although infrequently studied, the relationship between narcissism and high levels of victimization has been identified in some studies with young adults who, due to their arrogant ego, were more likely to identify themselves as victims in general (McCullough et al., 2003; Ok et al., 2020). In this regard, as noted by Fanti and Kimonis (2012), narcissistic youth may exhibit a fragile self-perception and become more susceptible to perceived threats from others, such as from peers at school. The narcissist's tendency toward victimization is equally consistent with other psychological characteristics associated with narcissists, such as the higher propensity to be vindictive and paranoid (Day et al., 2020).

The interaction between victimization and gender, where both the levels of narcissism and Machiavellianism are comparatively higher in the case of boys, could be part of a single self-defense strategy. These results would be in line with the explanation postulated from the Theory of Social Reputation (Estévez et al., 2012), which responds to the case of some victims of bullying, especially boys, who in turn opt to model a social image based on arrogance and egocentricity, which will 'protect' them from future attacks. All these associations need to be analyzed in detail in order to clarify the findings of the present study.

Limitations and Future Research

Overall, the results of this study contribute to the expanding knowledge about the role of the Dark Tetrad personality traits in the context of bullying, with aggressors and victims of both genders. However, the authors acknowledge certain limitations that should be considered for future research. One of them is based on the cross sectional and correlational nature of the data, which makes it impossible to establish causal relationships between the variables analyzed; as not having a longitudinal study, it is not possible to state whether personality traits are a cause or consequence of bullying behaviors. In addition, in this paper we have only analyzed the "pure" roles of aggressor and victim without taking into account the combined role of the victimized aggressor or the aggressive victim, whose personality traits may help us to better understand their particular situation. It should be also noted that data from this study were obtained exclusively through self-report measures and are limited to adolescents between 11 and 17 years old, so they are not to be extrapolated to individuals of other educational levels as university students.

Despite these limitations, we consider that this study makes a significant contribution to the current scientific literature about personality and bullying among peers in

adolescence, especially if we take into account that the previous studies have focused, almost exclusively, on the analysis of the dark traits of bullies. Only one previous study has considered the four Dark Tetrad traits in victims of school bullying (Pineda et al., 2022), but none has examined the gender differences in victims or bullies. Therefore, the data presented herein may be taken as a basis and incentive to continue working on this line of research, analyzing how certain people feel and behave in situations of mistreatment in the early stages of life with the goal of offering more effective prevention and intervention strategies, and trying to analyze the tetrad traits as unique constructs even as they are intercorrelated, as suggested by Jain et al. (2023), to better understand their particular contribution.

Practical Implications

The present findings hold significant practical implications for the development of multilevel interventions aimed at preventing and addressing bullying in adolescence. At the school-wide level, the results support the implementation of comprehensive socio-emotional learning programs and school climate initiatives that go beyond behavioral regulation to also address dark personality tendencies, such as moral disengagement, impulsivity, and lack of empathy (Hall, 2017). These programs should incorporate psychoeducational content that fosters empathy development, emotional self-awareness, and recognition of manipulative or sadistic behaviors.

For aggressors presenting high levels of Dark Tetrad traits, individualized or small-group cognitive behavioral interventions may be particularly beneficial in addressing affective empathy deficits, impulse control problems, and belief systems that reinforce dominance and aggression (Montero-Carretero et al., 2021). These interventions should be adapted according to gender differences in the expression and internalization of such traits, ensuring a developmentally appropriate approach.

Regarding victimized adolescents with elevated dark traits, the findings underscore the need to avoid assuming passivity or vulnerability as uniform victim characteristics. Certain personality features may hinder help-seeking behaviors or exacerbate peer rejection and social isolation (Fanti and Kimonis, 2012). For these students, targeted support should focus on building trust, fostering healthy relational patterns, and enhancing coping strategies through resilience-based and trauma-informed approaches. Interventions such as peer mentoring, restorative practices, and individual counseling can be effective when delivered by multidisciplinary teams involving school psychologists, counselors, and educators.

In sum, these findings call for a personality-informed and gender-sensitive framework in bullying prevention and

intervention, one that acknowledges the complex interplay between personality traits, social dynamics, and individual coping styles in adolescence.

Conclusion

This study provides several key insights into the interplay between Dark Tetrad traits and school bullying among adolescents. It firmly establishes that higher levels of Machiavellianism, psychopathy, sadism, and narcissism are associated with greater involvement in bullying, both as aggressors and victims. Machiavellianism and psychopathy were particularly pronounced in high-aggression individuals, aligning with prior research linking these traits to violent behavior.

Contrary to initial hypotheses, gender did not generally influence the levels of Machiavellianism, psychopathy, or narcissism in either bullies or victims. However, higher levels of sadism were observed in boys. Additionally, the study found that victimized boys had more elevated levels of Machiavellianism and narcissism compared to victimized girls, suggesting these traits could potentially serve as coping mechanisms. Overall, these findings contribute to a deeper understanding of the role of Dark Tetrad traits in bullying behaviors and point to the need for further gender-specific analyses.

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Declarations

Conflict of interest The authors of this article declare none competing interest.

Ethical Approval This research was conducted in accordance with the American Psychology Association ethical standards and the 1964 Helsinki Declaration and its later amendments. The study was approved by the institutional review boards and the ethical committees from the participant Universities.

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