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Original research paper

THE EFFECTS OF NEGATIVE LIFE EVENTS AND DARK TETRAD TRAITS ON ANTISOCIAL BEHAVIOUR IN ADOLESCENTS

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ABSTRACT

Previous studies have shown that exposure to adverse life events is positively associated with a tendency towards antisocial behavior. However, results concerning relationships between antisocial behaviour and internal factors, such as personality traits, are not so consistent. The present study aimed to examine the effects of negative life events and Dark Tetrad traits (narcissism, Machiavellianism, psychopathy, and sadism) on different antisocial behaviors, including norm-breaking, aggression, vandalism, and drug use. The sample included 221 high school students (66% females) from three cities in Serbia. Results showed that negative life events significantly predicted norm-breaking, aggression, and vandalism, while such life events' power to predict drug use ceased once the dark traits were added to the regression model. In the case of dark traits, narcissism, psychopathy, and sadism positively predicted norm-breaking and aggression, while sadism also predicted vandalism. Machiavellianism did not significantly predict any of the antisocial behaviors. The results suggest that norm-breaking is largely explained by both negative life events and personality traits. Aggression, on the other hand, is better explained by personality traits. Finally, the examined factors contribute much less to the explanation of vandalism and drug use. The results are discussed in the context of possible prevention of antisocial behavior in adolescents.

Key words:

Antisocial behavior, delinquency, negative life events, Dark Tetrad, Dark Triad

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■ INTRODUCTION

Antisocial behaviour has piqued the interest of numerous researchers, predominantly due to its consequences for victims, perpetrators, their families, and society as a whole. Antisocial behaviour encompasses actions directed towards harming others, destroying property, and violating other people's rights, social norms, and laws (Burt & Neiderhiser, 2009; Lahey & Waldman, 2005). As children grow up, they exhibit antisocial behaviour in different ways. In younger children, this usually takes the form of problematic behaviour involving verbal and/or physical aggression expressed during preschool or school activities. In adolescents, such behaviour can take on more dire proportions and involve delinquent behaviour and substance abuse (Ehrenreich, Underwood & Ackerman, 2014; Jalling, Bodin, Romelsjö, Källmén, Durbeej & Tengström, 2016).

Antisocial behaviour is most pronounced during adolescence, with the majority of adolescents reporting that they exhibit at least one form of antisocial behaviour (Chabrol, Van Leeuwen, Rodgers & Séjourné, 2009; Junger-Tas, Terlouw & Klein, 1994; Mahoney & Stattin, 2000). In terms of gender differences, research has shown that antisocial behaviour is more common among men, although differences are less salient in adolescence in comparison to other life stages, including childhood and adulthood (Maneiro, Gómez-Fraguela, Cutrín & Romero, 2017; Moffitt & Caspi, 2001; Odgers *et al.*, 2008; Russell, Robins & Odgers, 2014).

To explain the tendency towards antisocial behaviour, it is necessary to consider a complex constellation of factors. Studies have revealed links between different groups of factors (e.g., unfavourable family and school settings, a lower socioeconomic status, and basic personality traits) and the development and manifestation of antisocial behaviour (Deković, Janssens & Van As, 2003; Farrington, 2005; López Larrosa & Rodríguez-Arias Palomo, 2012; Miller & Lynam, 2001; Otto, Kaman, Erhart, Barkmann, Klasen, Schlac & Ravens-Sieberer 2021; Piotrowska, Stride, Maughan & Rowe 2019; Reid & Patterson, 1989). In this study, we focused on two groups of factors: external, related to the exposure to negative life events, and internal, related to socially undesirable personality traits, that is, to Dark Tetrad traits.

Negative Life Events and Antisocial Behaviour

Negative life events include a wide range of negative experiences, including domestic violence, parents' divorce, the death or sickness of a loved one, neglect, and/or peer violence, changing schools, grade repetition, and unpleasant sexual experiences. Negative events during childhood or adolescence can influence the development and subsequent functioning of an individual. Consistently, research has shown that as

the number of negative life events increases, so does the likelihood of exhibiting antisocial behaviour (Connolly, 2020; Duke, Pettingell, McMorris & Borowsky, 2010; Loeber & Stouthamer-Loeber, 1998). For example, researchers have observed a significant link between being physically and/or sexually abused by a family member as an adolescent and exhibiting violence in romantic relationships later in life, as well as carrying weapons, running away from home, sexual aggression, and substance abuse (Duke *et al.*, 2010). Jugović (2004) found that young individuals whose parents abused alcohol were 2 to 3 times more likely to indulge in alcohol than their peers whose parents did not drink. Furthermore, the study revealed the use of marijuana in more than half of young individuals whose both parents abused alcohol.

In school settings, domestic research has shown that both victims and perpetrators of peer violence tend to exhibit antisocial behaviour, including various forms of aggression (Dinić, Sokolovska, Milovanović & Oljača, 2014). In addition to participation in peer violence, grade repetition is a significant predictor of delinquent behaviour (Chabrol *et al.*, 2009). In other words, victimization and exposure to negative life events increase the likelihood of subsequent engagement in delinquent or otherwise antisocial behaviour (Hay & Evans, 2006).

The Dark Tetrad and Antisocial Behaviour

When it comes to internal factors in the domain of personality traits, so far, research has predominantly focused on basic personality traits (e.g., the Big Five personality traits). The results have been fairly consistent, showing that antisocial behaviour is negatively linked to conscientiousness and agreeableness (e.g., Miller, Lynam & Jones, 2008) and is positively linked to neuroticism (Castellani, Pastorelli, Eisenberg, Gerbino, Di Giunta, Ceravolo & Milioni, 2014; Jones, Miller & Lynam., 2011).

However, due to the characteristics of antisocial behaviour, it is reasonable to assume that the search for correlates should not focus on basic personality traits but rather on socially undesirable or maladaptive personality traits, such as those encompassed by the Dark Triad. The Dark Triad includes subclinical narcissism, Machiavellianism, and subclinical psychopathy (Paulhus & Williams, 2002). Narcissism is characterized by grandiosity and a sense of entitlement. Machiavellianism is associated with manipulateness and a tendency toward planning or developing strategies to maximize the likelihood of attaining long-term, often selfish goals (Jones & Paulhus, 2009). Psychopathy is characterized by a lack of empathy and remorse, shallow affect, and impulsivity (Paulhus & Williams, 2002). After the conceptualization of the Dark Triad, sadism was added as the fourth trait, thus forming the Dark Tetrad (Chabrol *et al.*, 2009). Sadism represents the tendency to derive pleasure from other people's pain and suffering (Chabrol *et al.*, 2009) and assert dominance by harming others (O'Meara, Davies & Hammond, 2011). Callousness, an aspect of the antagonism, is found to be the Dark Core of the broader

constellation of dark traits (Dinić, Wertag, Sokolovska & Tomašević, 2021). Studies have consistently shown that men achieve higher scores on all dark traits (Chabrol *et al.*, 2009; Muris, Merckelbach, Otgaar & Meijer, 2017).

A review of the first decade of research on the Dark Triad revealed the link that this constellation shares with antisocial behaviour (Furnham, Richards & Paulhus, 2013). Studies conducted on sample groups of children and adolescents have shown that the tendency towards delinquency and behaviour problems are more common, serious, and diverse in young individuals with high scores on psychopathy (Frick & White, 2008; Muris, Meesters & Timmermans, 2013; Pechorro, DeLisi, Gonçalves, Braga & Maroco, 2022; van Baardewijk, Stegge, Bushman & Vermeiren, 2009). Apart from psychopathy, narcissism has shown significant relations with behaviour problems and aggression (Barry, Frick, Adler & Grafeman, 2007; Barry, Grafeman, Adler & Pickard, 2007; Fanti & Kimonis, 2012; Lau & Marsee, 2013). The results of a meta-analytic study confirmed a significant link between narcissism and aggression (Kjærviik & Bushman, 2021). Still, there are various triggers of aggression and psychopathy is predominantly linked to aggression which emerges as a reaction to a physical threat (Jones & Paulhus, 2010). Psychopathy has proven to be a better predictor of direct and physical aggression, with the assumption that choosing explicit forms of aggression is ascribed to fearlessness and sensation seeking (Essau, Sasagawa & Frick, 2006; Lau & Marsee, 2013). Narcissism is generally associated with aggression due to a perceived ego threat (Thomaes, Bushman, Stegge & Olthof, 2008). However, some authors (e.g., Kjærviik & Bushman, 2021) found a link between narcissism and aggression, even in the absence of ego-provocation (due to perceiving others as inferior). Likewise, psychopathy is linked to instrumental aggression (Frick, Cornell, Barry, Bodin & Dane, 2003), while narcissism is more associated with reactive aggression (Thomaes *et al.*, 2008). When it comes to Machiavellianism, research conducted on adolescent samples has shown it to be related to violent, delinquent, and aggressive behaviour (Muris, Meesters & Timmermans, 2013; Sutton & Keogh, 2000). However, when different functions of aggression are taken into account, it becomes clear that Machiavellianism is more associated with indirect, instrumental aggression (Klimstra, Sijtsema, Henrichs & Cima, 2014). It can be concluded that Machiavellianism can be related to antisocial behaviour, but only when the person expects personal gain and deems the risk of getting caught to be extremely small or non-existent (Fehr, Samsom & Paulhus, 1992; Jones & Paulhus, 2009).

Some findings suggest that not all dark traits contribute to the explanation of different forms of antisocial behaviour in the same manner. For example, the Dark Triad composite score has been linked to a youth's delinquent behaviour but not drug use (Wright, Morgan, Almeida, Almosaed, Moghrabi & Bashatah, 2017). A study conducted on a sample of juvenile delinquents, which focused on psychopathy, found this trait to be a good predictor of violence and theft, but not substance abuse (Vaughn, Newhill, DeLisi, Beaver & Howard, 2008). In a study that explored

the Dark Triad traits in a sample of adolescents at risk, narcissism was linked to substance abuse (cigarettes and different kinds of drugs), Machiavellianism was linked to the use of alcohol, while psychopathy was not related to substance abuse (Pechorro, Jonason, Raposo & Maroco, 2021). While some studies have reported links between Machiavellianism and narcissism and delinquent behaviour (Lau & Marsee, 2013; Palma, Pechorro, Prather, Matavelli, Correia & Jesus, 2021; Pechorro *et al.*, 2021), others suggested that these traits do not contribute to the explanation of antisocial behaviour (Chabrol *et al.*, 2009; Muris, Meesters & Timmermans, 2013; Palma, Pechorro, Nunes, Correia & Jesus, 2020; Pechorro, DeLisi, Gonçalves, Braga & Maroco, 2022). Both traits are associated with emotional dysregulation, and narcissism is also linked to behavioural dysregulation. In other words, it seems that although both traits are characterized by outbursts of strong emotions (e.g., anger, rage), young individuals with high scores on Machiavellianism exhibit a greater ability to control behaviour as a response in such situations (Lau & Marsee, 2013).

As sadism was only later introduced into the dark trait constellation, fewer studies have examined it. In several of these studies, however, sadism proved to be related to a specific form of aggression (Chester, DeWall & Enjaian, 2019). Although psychopathy and narcissism are often associated with displaying proactive aggression, only sadism has contributed to the explanation of unprovoked aggression, even in situations that require an individual to invest time and energy to harm another person (Buckels, Jones & Paulhus, 2013; Reidy, Zeichner & Seibert, 2011). When it comes to antisocial behaviour, research has shown that sadism contributes to the explanation of the variance in antisocial and violent behaviour in adolescents above and beyond the Dark Triad (van Geel, Goemans, Toprak & Vedder, 2017), but some studies found this to be true for male participants only (Chabrol *et al.*, 2009). Likewise, studies have reported a positive link between sadism and vandalism (Pfattheicher, Keller & Knezevic, 2019). It is assumed that the pleasure derived from hurting and/or dominating and controlling others is present even when destroying objects (Pfattheicher, Keller & Knezevic, 2019).

Although an increasing number of studies have emphasized dark traits' significant contributions to the explanation of antisocial behaviour, so far studies conducted on samples of young individuals have not been entirely consistent in terms of the unique contribution of each trait (e.g., Chabrol *et al.*, 2009; Lau & Marsee, 2013; Palma *et al.*, 2021). In addition to this inconsistency, while earlier studies treated antisocial behaviour as a singular phenomenon, research has indicated that it is necessary to explore individual aspects of antisocial behaviour.

Research Aims

In this research, we examined the effects of the frequency of negative life events and the Dark Tetrad traits on different forms of antisocial behaviour in adolescents (norm violations, theft, substance use, aggression, and vandalism). Although negative life events encompass a wide range of different experiences, this study centred on negative events that adolescents are known to experience within family, peer, and school contexts. Most studies conducted so far have focused on predicting antisocial behaviour based only on one group of factors – negative life events or personality traits (e.g., Duke *et al.*, 2010; Jones, Miller & Lynam, 2011). This study aimed to offer a more comprehensive insight by encompassing both environmental (negative life events) and dispositional (dark traits) factors.

Based on previous research (e.g., Deković, Janssens & Van As, 2003; Otto *et al.*, 2021), we expected to find a positive link between exposure to negative life events and antisocial behaviour. Having in mind that studies have consistently linked psychopathy to delinquent and aggressive behaviour (Muris, Meesters & Timmermans, 2013; Palma *et al.*, 2021), we assumed that psychopathy would show significant links with all forms of antisocial behaviour, apart from drug use (Pechorro *et al.*, 2021; Vaughn *et al.*, 2008). Despite calls for a more detailed examination of the role of sadism in delinquent behaviour during the previous decade (Chabrol *et al.*, 2009), very few studies have focused on this topic. Based on the several studies conducted on samples of young individuals (Chabrol *et al.*, 2009) and adults (Chester, DeWall & Enjaian, 2019; Pfattheicher, Keller & Knezevic, 2019), we expected sadism to be a significant predictor of aggression and vandalism. In the absence of earlier studies examining the relationship between sadism and drug abuse, we relied on theoretical expectations to assume that we would not obtain a significant relation, as drug use is not linked to asserting domination or inflicting harm upon others. We expected to find significant links between Machiavellianism and narcissism and drug abuse (Pechorro *et al.*, 2021). However, when it comes to links with other forms of antisocial behaviour, such as aggression and vandalism, the findings have been inconsistent, indicating the uniqueness of the manifestation of these forms of antisocial behaviour in narcissism and Machiavellianism (Jones & Paulhus, 2010; Klimstra *et al.*, 2014). With this in mind, one of our research aims was to examine the patterns of relations between Machiavellianism and narcissism and various forms of antisocial behaviour.

METHOD

Sample and procedure

The sample comprised 221 high school students (66% girls) from three cities in Serbia (Subotica, Novi Sad, and Jagodina). The students were in their II, III, and IV grades of high school (gymnasiums, secondary economic and technical schools). The overall number of included schools was nine. In each of the three cities and each school, we randomly selected one class, considering that the number of students from different grades and schools was relatively equal (see Figure 1). First-grade students did not participate in the study. They were at the very beginning of high school and were assumed to lack sufficient interaction with other students to have enough experiences representative of this period of life. The age of the participants ranged from 16 to 19 years ($M = 17.3$, $SD = .91$). The study was approved by the Ethics committee of the Department of Psychology of the Faculty of Philosophy in Novi Sad (code 201703201755_Ehg3).

Table 1: Sample characteristics

Grade	II		III		IV		Total
	male	female	male	female	male	female	
Gymnasium	7	13	10	16	15	19	80
Economics school	5	23	4	27	9	12	81
Technical school	4	11	0	24	20	1	60
Total	63		81		77		221

Instruments

Negative Life Events Check-List for adolescents (Negative Life Events – NLE). An NLE checklist was constructed for this research. It was based on existing questionnaires: Early Trauma Inventory: Self-Report (ETI-SR; Bremner, Bolus & Mayer, 2007) and Adolescent Life Events Stress Scale (ALESS; Aggarwal, Prabhu, Anand & Kotwal, 2007), which measure exposure to negative or traumatic life events. To construct NLE, we retained only those events relevant to the adolescents' experience (e.g., divorce of a parent or guardian, change of school, loss of a parent's job, domestic violence). The final checklist consists of 22 items with a binary response format (Yes / No). The Cronbach's alpha coefficient is .73.

Antisocial Behaviour Questionnaire (ABQ; Luengo, Otero, Romero, Gómez-Fraguela & Tavares-Filho, 1999). The ABQ originally comprises 30 items describing various forms of antisocial behaviour. For this study, we included 3 more items considered relevant for adolescents (“I urinated in a public place.”; “I was loud, shouted or sang loudly in a public place.”; “I ran away from class, received a reprimand or a lower grade from the government.”). Two independent translators translated the questionnaire from Spanish to Serbian, after which the translation was harmonized. The response format was a 4-point Likert-type scale (0 = *never*; 1 = *very rarely*; 2 = *sometimes*; 3 = *often*). The questionnaire operationalized five dimensions of antisocial behaviour: drug abuse ($\alpha = .73$, $n = 4$), rule-breaking ($\alpha = .81$, $n = 10$), theft ($\alpha = .41$, $n = 7$), aggression ($\alpha = .69$, $n = 6$), vandalism ($\alpha = .71$, $n = 6$), and theft. However, the theft subscale is excluded from further analyses, given its unsatisfactory internal consistency.

Short Dark Triad Scale (SD3; Jones & Paulhus, 2014; for Serbian adaptation, see Dinić, Petrović & Jonason, 2018). SD3 consists of 27 items, 9 for each of the three dimensions of the Dark Triad: psychopathy ($\alpha = .75$), Machiavellianism ($\alpha = .75$) and narcissism ($\alpha = .70$). Upon the approval of the scale’s author, one item was adjusted to fit the adolescents better (item 26, “I enjoy kissing people I barely know,” Velimirović, Bojanić & Dinić, 2018). The response format is a 5-point Likert-type scale (from 1 = *completely disagree* to 5 = *completely agree*).

Short Sadistic Impulse Scale (SSIS; O’Meara *et al.*, 2011; for Serbian adaptation, see Dinić, BulutAllred, Petrović & Wertag, 2020). SSIS contains 10 items ($\alpha = .80$) with the 5-point Likert-type scale (from 1 = *completely disagree* to 5 = *completely agree*).

■ RESULTS

In the previous year, 92.8% of respondents reported at least one form of antisocial behaviour (8.14% for drug use; 22.17% for theft; 42.08% for vandalism; 65.16% for aggression; 88.24% for rule-breaking). The most common antisocial behaviour reported by adolescents are mainly those related to rule-breaking (excessive alcohol consumption, shouting or singing loudly in public, socializing with people who often get into trouble, skipping classes, getting reprimands or lower grades, and urinating in public places). These are followed by aggressive behaviour (hitting another person at school, fighting with another person).

In the case of negative life events, 47.5% of respondents reported that they had experienced five or more negative life events, and 10% of respondents reported that they had experienced ten or more such events (out of 22). Only seven respondents (3.2%) stated that they had not experienced any of the events of those included in our questionnaire. Most frequently, adolescents reported witnessing violence in public spaces, being overwhelmed with school obligations, a serious quarrel with a close

friend, and a severe injury, accident or death of a relative or friend. The fifth most commonly reported event was a physical attack.

Before conducting the analyses, we assessed the normality of distributions of the relevant variables. Distributions of sadism, aggression, vandalism and drug use deviated significantly from normality (skewness and kurtosis $> \pm 2$; for more details, see Dinić, 2019), so these variables were normalized using rankit transformation. The results of t-tests indicated that male respondents scored significantly higher on Machiavellianism, psychopathy and sadism, as well as on all forms of antisocial behaviour (Table 2). The effect sizes were interpreted according to Cohen's (Cohen, 1988) convention, and they ranged from small (in the case of Machiavellianism, psychopathy, sadism, and drug use) to moderate (rule-breaking and aggression) and large (vandalism). Gender differences were not found in the case of negative life events, narcissism, and drug use. As some gender differences were significant, gender will be included as a control variable in further analyses.

Table 2: Gender differences in Dark Tetrad traits, frequency of negative life events, and different dimensions of antisocial behaviour

	Total (<i>N</i> = 221)		Males (<i>n</i> = 74)		Females (<i>n</i> = 146)		<i>t</i> (218)	<i>d</i>
	M	SD	M	SD	M	SD		
Negative events	.23	.15	.26	.15	.22	.15	1.77	.27
Machiavellianism	3.18	.69	3.33	.65	3.10	.69	2.43*	.34
Narcissism	3.12	.62	3.07	.61	3.14	.63	-.80	.11
Psychopathy	2.48	.72	2.68	.66	2.38	.73	3.01**	.43
Sadism	1.87	.64	2.09	.76	1.76	.54	2.98***	.45
Rule-breaking	.77	.56	1.03	.60	.63	.48	5.02***	.74
Aggression	.30	.36	.49	.45	.21	.25	5.38***	.79
Vandalism	.17	.31	.35	.45	.07	.13	6.48***	.99
Drug use	.05	.22	.10	.34	.02	.13	2.60***	.41

Note: The theoretical range of scales' scores is 0 to 1 for negative life events, 0 to 3 for antisocial behaviours, and 1 to 5 for dark traits; descriptive data are presented for raw scores, and differences are calculated using normalized scores; + = t-statistics value when the equality of variances condition is violated. * $p < .05$, ** $p < .01$, *** $p < .001$.

In order to determine the contribution of negative life events and Dark Tetrad traits in explaining antisocial behaviour, four hierarchical multiple regression analyses were conducted, with different forms of antisocial behaviour entered as criteria.

Gender was included in the first step of the analysis to control for its effect. Negative life events were included in the second, while the Dark Tetrad traits were included in the third step.

According to the results, negative life events contribute significantly to the prediction of all forms of antisocial behaviour, with their contribution being the highest in the case of rule-breaking (15% of explained variance). After the Dark Tetrad traits are introduced into the model, negative life events no longer significantly predict drug use but remain a significant predictor of rule-breaking, aggression, and vandalism. Dark traits contribute significantly to the explanation of rule-breaking (15%), aggression (16%), and vandalism (6%), but not to drug use (3%). From the domain of dark traits, rule-breaking and aggression are significantly predicted by narcissism, psychopathy, and sadism, while the only significant predictor of vandalism is sadism (Table 3).

Table 3: Predicting dimensions of antisocial behaviour based on gender, negative life events, and Dark Tetrad traits

		Rule-breaking	Aggression	Vandalism	Drug use
		β	β	β	β
I step	Gender	-.34***	-.37***	-.45***	-.21**
	R ²	.12	.13	.21	.04
	F(1,218)	28.99***	33.75***	56.72***	9.89**
II step	Gender	-.30***	-.34***	-.43***	-.19**
	Negative events	.39***	.24***	.20**	.15*
	ΔR^2	.15	.06	.04	.02
	$\Delta F(1,217)$	44.28***	15.77***	11.19**	5.31*
III step	Gender	-.26***	-.28***	-.38***	-.18*
	Negative events	.29***	.14*	.14*	.11
	Machiavellianism	.02	-.05	.02	-.08
	Narcissism	.23**	.16*	.05	.09
	Psychopathy	.14*	.20**	.09	.14
	Sadism	.13*	.20**	.17*	.04
	ΔR^2	.15	.16	.06	.03
$\Delta F(4,213)$	13.81***	12.84***	4.60**	1.72	
TotalR ²		.42	.35	.31	.10

Note: Gender was coded as 1 = males, 2 = females. * $p < .05$, ** $p < .01$, *** $p < .001$.

■ DISCUSSION

To gain a better understanding of antisocial behaviour in the general population of adolescents, our research focused on examining the effects of negative life events and dark personality traits on different forms of antisocial behaviour – rule-breaking, drug use, aggression, and vandalism. In line with the findings of earlier studies in other countries (Andershed, Gustafson, Kerr & Stattin, 2002; Chabrol *et al.*, 2009; Claes, Lacourse, Ercolani, Pierro, Leone & Presaghi, 2005; Mahoney & Stattin, 2000; Romero, Sobral, Luengo & Marzoa, 2001), most participants reported exhibiting at least one form of antisocial behaviour during the previous year. The finding that about 93% of adolescents exhibited at least one type of antisocial behaviour during the previous 12 months may sound disconcerting. In an attempt to better understand and explain this finding, we examined participants' responses to individual items. According to the data, the majority of our participants stated that they had exhibited antisocial behaviour "very rarely." For example, about 50% of participants responded affirmatively to the item "I hit someone during a fight", but only 3% stated that this happened often. The response category "often" was selected with varied frequency, ranging from 0% to 25.3%. The behaviour for which the "often" category was frequently selected were mostly related to the use of alcohol. For instance, 18.6% responded "often" to the item "I got drunk or felt dizzy because I had too much to drink," and 17.2% responded "often" to "I was loud, shouted or sang loudly in a public place". Rule-breaking constituted the most common form of antisocial behaviour, in line with some previous research (e.g., Becht, Prinzie, Deković, van den Akker & Shiner, 2016). It is worth noting that some studies reported physical aggression as the most common form of antisocial behaviour in adolescents (Cuervo, Villanueva, Born & Gavray, 2018; Modecki, Uink & Barber, 2018). The obtained results are in relatively good agreement with the findings of earlier domestic studies. For example, the estimated frequency of drug use (8.14%) in our study was similar (Rakić, Rakić, Milošević & Nedeljković, 2014; Mitrović, Smederevac, Grujičić & Čolović, 2006) or lower than (Radovanović, Spasić & Radovanović, 2019) the estimated frequency in earlier research. Similarly, this is true for theft frequency (Mitrović *et al.*, 2006) as well as alcohol use (Lutula-Golo, Ćirić-Janković, Šantrić-Milićević & Simić, 2013; Marić, 2012), which falls within the rule-breaking scale of the applied ABQ.

Male participants achieved higher scores on all forms of antisocial behaviour, which is in line with earlier findings (e.g., Maneiro *et al.*, 2017). Furthermore, male participants achieved higher scores on all dimensions of the Dark Tetrad, apart from narcissism, which is partially in line with earlier studies showing that male adolescents achieve higher scores on all dark traits (Palma *et al.*, 2020; Pechorro *et al.*, 2021). Although some studies suggest that male adolescents achieve higher scores on narcissism than females (Grijalva, Newman, Tay, Donnellan, Harms, Robins & Yan 2015; Zhou, Li, Zhang & Zeng, 2012), the absence of gender differences in narcissism

could be explained by the increasing emphasis on individualism, competitiveness, and success in modern society. Such an emphasis results in narcissistic traits being viewed as socially desirable to a certain extent, both in male and female adolescents (Chabrol *et al.*, 2009).

The results revealed negative life events to be predictors of all forms of antisocial behaviour, which is in line with earlier findings (Duke *et al.*, 2010; Hoffmann, Cerbone & Su, 2000; Kingsbury, Clayborne, Colman & Kirkbride, 2020; Loeber & Stouthamer-Loeber, 1998; Low, Dugas, O’Loughlin, Rodriguez, Contreras, Chaiton & O’Loughlin 2012; Stouthamer-Loeber, Loeber, Homish & Wei, 2001). We should emphasize that after the introduction of dark traits, negative life events no longer constituted a significant predictor of drug use. The only remaining significant predictor was the male gender.

Dark traits contributed to the prediction of specific forms of antisocial behaviour above and beyond the variance explained by negative life events. Psychopathy and narcissism emerged as significant predictors of aggression and rule-breaking, which is in line with previous research (for a meta-analysis of relations between narcissism and aggression, see Kjærviik & Bushman, 2021; for psychopathy, see Chabrol *et al.*, 2009; Lau & Marsee 2013; Muris, Meesters & Timmermans, 2013). One could hypothesize that young individuals with high scores on psychopathy are less concerned about the consequences of their behaviour. They even display explicit forms of aggression and disregard social norms because they are not afraid of getting caught (Lau & Marsee, 2013). Hence, it seems that young individuals with high scores on psychopathy manifest aggressive and delinquent behaviour to a greater extent due to impulsivity and expected gain from antisocial behaviour (Barry, Frick, DeShazo, McCoy, Ellis & Loney 2000; Essau, Sasagawa & Frick, 2006; Frick, Cornell, Bodin, Dane, Barry & Loney, 2003; Lau & Marsee, 2013). Similarly, young individuals with high scores on narcissism are prone to expressing aggression due to emotional and behavioural dysregulation (Kjærviik & Bushman, 2021; Lau & Marsee, 2013). Research has shown a link between narcissism and disregard for various social norms (Adams, Florell, Alex Burton & Hart, 2014; DeWall, Buffardi, Bonser & Campbell, 2011; Holtzman, Vazire & Mehl, 2010). It is assumed that adolescents with high scores on narcissism violate social norms (through shouting, singing loudly in public, or truancy) in an effort to attract others’ attention or to assert their dominance.

Sadism emerged as a significant predictor of rule-breaking, aggression, and vandalism, in line with previous research showing sadism’s positive contributions to delinquent, aggressive, and vandal behaviour (Chabrol *et al.*, 2009; Chester, DeWall & Enjaian, 2019; Pfattheicher, Keller & Knezevic, 2019). Consistent with previous findings (Chabrol *et al.*, 2009; Pfattheicher, Keller & Knezevic, 2019), sadism’s significant contribution to the prediction of aggression could be explained by positive affect and pleasure derived from expressing aggression and observing the consequent suffering of the victim. This positive affect is likewise present when

destroying objects and property. The novelty of this research lies in the finding that sadism also contributed to the explanation of rule-breaking, which indicates that sadism may be linked to a wider range of harm-inflicting behaviour directed not only against people and objects but social order as well. Namely, a recent study showed that of all the Dark Tetrad traits, sadism was most strongly linked to the need for chaos and disorder (Plančak, Milošević & Dinić, 2021).

Finally, our results showed that Machiavellianism did not contribute to the prediction of any form of antisocial behaviour in adolescents, which is in line with some previous studies reporting the absence of its contribution to youth's delinquent behaviour (Chabrol *et al.*, 2009; Lau & Marsee, 2013). It is worth noting that Machiavellianism is the only dark trait characterized by behavioural control and a strategic approach to goals. Thus, it is reasonable to assume that adolescents who score high on Machiavellianism are unlikely to engage in openly antisocial behaviour, as such behaviour could ruin their reputation and cause problems. It is important to emphasize that although certain studies reported a significant correlation between delinquent behaviour and Machiavellianism, this correlation was nonetheless weak (Muris, Meesters & Timmermans, 2013; Palma *et al.*, 2021; Pechorro *et al.*, 2021).

The main limitation of this research is that it relies exclusively on self-assessment questionnaires. Due to the nature of the examined constructs, socially desirable responses are an issue. Thus, future research should include the assessments of others, e.g., teachers. As this study was conducted on a convenient sample of adolescents from urban areas, the results could not be generalized to the entire adolescent population. In order to gain a better insight into the effects of external and internal factors on antisocial behaviour, future research should include delinquents. Despite these shortcomings, the value of the study is that it examined antisocial behaviour as a multidimensional phenomenon. Moreover, due to the scarcity of research on antisocial behaviour among adolescents in this region, this study contributes to our understanding of dispositional and environmental factors influencing the tendency toward antisocial behaviour.

■ CONCLUSION

The results of our research indicate that negative life events and certain dark traits are equally good predictors of the frequency of rule-breaking. Dark traits contributed more significantly to the explanation of aggression. The examined factors contributed less to the explanation of vandalism and drug abuse. Namely, it is assumed that the phenomena of vandal behaviour and drug abuse could be better explained by other factors, such as unfavourable family settings, hanging out with peers who engage in drug use, as well as other personality traits such as impulsivity (Nawi *et al.*, 2021; Nordmarker, Hjärthag, Perrin-Wallqvist & Archer, 2016).

Examining the factors that contribute to antisocial behaviour not only significantly improves our understanding of antisocial behaviour as a phenomenon but can also inform prevention and intervention strategies. As negative life events emerged as significant predictors of rule-breaking and aggression (i.e., the two most common forms of antisocial behaviour), educating adolescents on effective ways of dealing with aversive experiences seems important. Antisocial behaviour prevention could include trainings dedicated to the development of adequate strategies for overcoming negative life events, especially those frequently occurring in adolescence (e.g., arguments with close friends, an accident or the death of a loved one, the feeling of being overwhelmed by responsibilities, and being a victim of abuse). Likewise, prevention programs could centre around theme-based lectures, which would focus on preventing the development of different forms of antisocial behaviour.

When working with adolescents, interactive methods (e.g., role-playing and applying knowledge and skills) could be included to aid the development of cognitive abilities and social skills (Šaljić, 2017). Promoting cooperativeness and the importance of friendship in schools could contribute to antisocial behaviour prevention (for more information on preventive interventions in schools, see Šaljić, 2017). For now, it is important to encourage teachers to try to recognize potentially sensitive life circumstances that adolescents may be going through and to talk to them or encourage them to talk to a psychologist. In addition, the general recommendation is to assess personality traits associated with antisocial behaviour at school and offer adequate counselling to students at a higher risk of exhibiting antisocial behaviour. Such intervention would aid these students in devising strategies for dealing with stress, resolving conflicts, and emotional regulation, along with other skills that could contribute to a decrease in antisocial behaviour.

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