Current Research in Behavioral Sciences 7 (2024) 100160

Contents lists available at ScienceDirect

Current Research in Behavioral Sciences

journal homepage: www.elsevier.com/locate/crbeha

Wandering in the darkness of personality: Empathy, alexithymia and their relationship to the Dark Tetrad

Marialaura Di Tella [a], Sara Veggi [a], Agata Benfante [a,*], Darrick Jolliffe [b], David P. Farrington [c], Lorys Castelli [a], Georgia Zara [d]

[a] Department of Psychology, University of Turin, Turin, Italy
[b] Department of Law and Criminology, Royal Holloway, University of London, UK
[c] Institute of Criminology, University of Cambridge, UK
[d] Department of Law, University of Turin, Turin, Italy

ARTICLE INFO

Keywords:
Machiavellianism
Psychopathy
Narcissism
Sadism
Empathy
Alexithymia

ABSTRACT

The Dark Tetrad is a group of four personality traits, namely Machiavellianism, psychopathy, narcissism, and sadism. Although these traits are conceptually distinct, they also share a number of common characteristics. Previous evidence has suggested that the Dark Tetrad traits could be associated with reduced empathy and difficulty recognising one's own emotions (i.e. alexithymia). The aim of this study was to further investigate the relationship between Dark Tetrad personality traits, alexithymia, and empathy in a large sample of the general population.

Data were collected via an anonymous online survey. A total of 1548 participants met the inclusion criteria and formed the final sample. Participants were asked to provide socio-demographic information and complete questionnaires assessing Dark Tetrad traits, empathy, and alexithymia.

Mediation analyses revealed that Machiavellianism, psychopathy, and sadism had both a direct and an indirect effect on empathy, with alexithymia being a significant mediator in the relationship between these traits and empathy, even after controlling for age and gender. Conversely, narcissism was found to be significantly correlated only with alexithymia, but not with empathy.

Taken together, results show that people with Dark Tetrad traits may have alterations in their socio-emotional abilities, with difficulties in recognising and understanding their own feelings and those of others. Individual differences in the levels of alexithymia and empathy should be taken into account in the treatment of individuals with adverse personality traits in order to prevent socially dangerous behaviours.

Introduction

The Dark Triad consists of three personality traits, namely Machiavellianism, psychopathy, and narcissism (Paulhus and Williams, 2002). Although these traits are conceptually distinct, they also share some common characteristics. In particular, they have been associated with dispositions such as egocentrism, manipulativeness, callousness, lack of humility, and aggressiveness (Jonason and McCain, 2012; Jones and Figueredo, 2013; Schimmenti et al., 2019). In addition to these shared characteristics, each component of the Dark Triad has its own unique features. Machiavellianism is characterised by limited interpersonal warmth, pragmatism, manipulation, and a willingness to take advantage of others (Christie and Geis, 1970), with the common associated expression that the ends justify the means (Jonason et al., 2012). Narcissism involves selfishness, a sense of entitlement and superiority, and a need for admiration (Morf and Rhodewalt, 2001). Psychopathy is associated with high impulsivity, poor emotional reactions and an increased risk of antisocial behaviour (Thompson et al., 2014).

More recently, an additional trait (sadism) has been recognised as being part of these dark personality traits, resulting in what is now called the Dark Tetrad (Bonfa-Araujo et al., 2022; Paulhus, 2014). Over time, several definitions of sadism have been proffered (e.g. Fromm, 1973; Shapiro, 1981), leading to an unclear delineation of this construct. This ambiguity is exacerbated by the fact that sadism has often been studied in the context of sexual sadism. In an attempt to characterise sadism as a personality trait that exists along a continuum, O'Meara et al. (2011)

* Corresponding author at: Via Verdi 10, 10124, Torino, Italy.
E-mail address: agata.benfante@unito.it (A. Benfante).

https://doi.org/10.1016/j.crbeha.2024.100160
Received 10 May 2024; Received in revised form 29 July 2024; Accepted 3 September 2024
Available online 6 September 2024

provided the following definition: "The term sadistic personality describes a person who humiliates others, shows a longstanding pattern of cruel or demeaning behaviour to others, or intentionally inflicts physical, sexual, or psychological pain or suffering on others in order to assert power and dominance or for pleasure and enjoyment" (O'Meara et al., 2011, p. 523).

Although some previous evidence has shown that these traits can have positive implications for individuals (e.g., Wai and Tiliopoulos, 2012), the behaviours elicited by Dark Tetrad personalities can often be detrimental to other people, leading these traits being viewed as socially adverse (Chabrol et al., 2017; Judge et al., 2009). All these personalities are in fact united by the lack of a fundamental interpersonal dimension, namely empathy (Baron-Cohen, 2011). Empathy, the ability to experience and understand others' feelings without confusing themselves with others (Decety and Lamm, 2006), plays a key role in social functioning as it allows individuals to comprehend, share, and respond to other people's emotions, gestures, and thoughts (Baron-Cohen and Wheelwright, 2004; Di Tella et al., 2023).

Reduced empathy has also been associated with a host of antisocial outcomes (e.g. Jolliffe and Farrington, 2021), as well as with difficulties in the ability to both regulate and recognise (i.e. alexithymia) one's own emotions correctly (e.g. Le Berre, 2019; Di Tella et al., 2020). Particularly, alexithymia is a multidimensional construct, characterised by difficulty in identifying and describing feelings, difficulty in distinguishing between feelings and bodily sensations of emotional arousal, restricted imagination processes, and an externally oriented cognitive style (Parker et al., 2008).

Although most previous studies have focused on examining empathy and its relation to Dark Tetrad (or Triad) personalities (e.g., Duradoni et al., 2023; Heym et al., 2021; Pajevic et al., 2018; Wertag, 2023), more recently researchers have started to draw their attention also on alexithymia (Cairncross et al., 2013; Garofalo et al., 2019). The available evidence seems to suggest that individuals who report higher levels of Dark Tetrad traits have reduced empathic abilities and also altered perception of their emotions, although with some differences among personalities noted (e.g. the findings with regards to narcissism are more inconsistent; Simard et al., 2023). To date, however, few studies have examined the combined role of empathy and alexithymia in relation to the Dark Tetrad (Burghart and Mier, 2022; Jonason and Krause, 2013; Schimmenti et al., 2019), and none have considered all four Dark Tetrad personalities simultaneously. In fact, previous research has focused predominantly on the Dark Triad traits, often neglecting sadism (Foulkes, 2019; Walker et al., 2021).

In an effort to fill this gap, this study aimed to further investigate the potential associations between Dark Tetrad personality traits, alexithymia, and empathy in a large and diverse sample from the general population. In particular, we investigated the potential mediating role of alexithymia in the relationship between each Dark Tetrad personality trait and empathy. We hypothesised the following:

H1: Individuals exhibiting higher levels of Dark Tetrad personality traits would show significantly lower levels of empathy.
H2: Alexithymia would act as a mediator in the relationship between Dark Tetrad personality traits and empathy.

Materials and methods

Participants and procedure

Data were gathered from July 1, 2023, to October 31, 2023, through an anonymous online survey. A snowball sampling strategy was used to recruit a broad and diverse range of participants with different sociodemographic characteristics. In this method, the initial respondents invited additional participants from their personal networks, thereby expanding the sample and enriching its diversity. The following exclusion criteria were set: age under 18; low level of education (< primary school); insufficient proficiency in Italian and the presence of severe psychiatric disorders (both assessed by a self-rated yes/no question). Initially, 1630 participants started the survey; however, 82 were excluded for not completing the questionnaire or not meeting the inclusion criteria. A total of 1548 participants made up the final sample.

The sample size was determined based on an a priori power analysis, using the software G*Power 3.1 (Faul et al., 2009), with a medium effect size ($f^2 = 0.15$; Cohen, 1988), power of over 0.80, and an alpha level of 0.05, as being sufficient for multiple regression analysis with five predictors.

This study was approved by the University Ethics Committee of the University of Turin (Italy) (protocol number 0289029) and was conducted in accordance with the Declaration of Helsinki. Informed consent was obtained from all participants before the beginning of the study.

Measures

Participants filled in a series of measures as part of a broader investigation, but only those instruments relevant to the present research questions are described here.

Sociodemographic and clinical information

Participants were required to indicate the following sociodemographic and clinical data: age, gender,[e] educational level, marital status, and presence or history of a psychiatric disorder (for inclusion/exclusion criteria).

Dark Tetrad personalities

The Italian version of the Dark Triad Dirty Dozen (DTDD) was used to assess the Dark Triad traits (Jonason and Webster, 2010; Schimmenti et al., 2019). The DTDD is a self-report measure that consists of 12 items (4 items for each trait). Participants are asked to indicate how much they agree, using a 5-point Likert type scale (from 0 "Not at all" to 4 "Very much"), with each of the presented statements. Items can be averaged to create both a total score and three subscale scores (Machiavellianism, psychopathy, and narcissism). Higher scores indicate higher levels of Dark Triad traits.

The scale has shown good internal consistency (Cronbach's α of about 0.75 across samples) and test-retest reliability (Jonason and Webster 2010). In line with these results, in our sample the Cronbach's alphas were good for each of the DTDD indexes (Machiavellianism: $\alpha = 0.86$; psychopathy: $\alpha = 0.70$; narcissism: $\alpha = 0.82$).

For the assessment of sadistic traits, the Italian translation of the Short Sadistic Impulse Scale (SSIS) was used (O'Meara et al., 2011; O'Meara and Davies, 2022). The SSIS is a 10-item self-report inventory derived from the 49-item Sadistic Attitudes and Behaviors Scale (Davies and Hand, 2003). Each item is scored on a 5-point Likert type scale, ranging from 1 ("Not at all like me") to 5 ("Very like me"). Higher scores indicate greater sadistic traits.

The scale has shown good internal consistency (Cronbach's $\alpha = 0.86$) (O'Meara et al., 2011). In our sample, Cronbach's alpha was 0.80.

Alexithymia

Alexithymia was assessed using the Italian version of the Toronto Alexithymia Scale (TAS-20) (Bressi et al., 1996; Taylor et al., 2003). It comprises 20 items, each scored on a 5-point Likert type scale (from 0 "Strongly disagree" to 5 "Strongly agree"). The results provide a

[e] Participants indicated the gender they identified with, choosing from three possible answer options: 0 = Female, 1 = Male, and 2 = Other. Only 8 participants selected the option 'Other'; therefore, as this category was not adequately represented, we considered these cases as missing.

TAS-20 total score and three subscale scores: difficulty identifying feelings; difficulty describing feelings; and externally-oriented thinking (Taylor et al., 2003). The TAS-20 cut-off scores are as follows: ≤ 51 no alexithymia, 52–60 borderline alexithymia, ≥ 61 alexithymia.

The scale has shown good internal consistency (Cronbach's alpha coefficient: ≥ 0.70) and test-retest reliability (Taylor et al., 2003). In line with these results, in our sample the Cronbach's alpha was good for the TAS-20 total score (α = 0.83).

Empathy

Empathy was assessed by means of the Italian version of the Basic Empathy Scale (BES; Albiero et al., 2010; Jolliffe and Farrington, 2006). It consists of 20-items, of which 9 items assess cognitive empathy and 11 items evaluate affective empathy. Each item is rated on a 5-point Likert type scale (from 1 "Strongly Disagree" to 5 "Strongly Agree"), with a total empathy score and two subscale scores that can be derived. Higher scores indicate greater empathy.

The scale has shown good internal consistency (Cronbach's alpha coefficients: ≥ 0.73) (Albiero et al., 2010). In our sample, Cronbach's alpha value was good for the BES total score (α = 0.86).

Statistical analysis

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 28.0 (IBM SPSS Statistics for Windows, Armonk, NY, USA: IBM Corp.).

Normal distribution was assessed using the indices for asymmetry and kurtosis. All variables were normally distributed.

First, the descriptive data was examined in order to obtain an overview of the socio-demographic and psychological characteristics of the respondents. The descriptive data were presented as means with standard deviations for continuous variables or as frequencies with percentages for categorical variables.

Second, preliminary Pearson correlation analyses were conducted to assess the presence of significant associations between our target variables (i.e. age, gender, alexithymia, empathy, and Dark Tetrad personality traits).

Third, PROCESS Macro 4 for SPSS (model 4) was used to examine the possible statistical mediation of alexithymia in the association between Dark Tetrad personality traits and empathy, controlling for sociodemographic variables. Only those variables significantly correlated with the dependent variable (i.e. empathy) were included in the mediation models. Ninety-five percent confidence intervals (CI) were calculated based on 5000 bootstrap samples, as per usual for this type of analysis (Hayes, 2009).

The level of significance for all statistical tests was set at $p < 0.05$.

Results

Sociodemographic and psychological data

Sociodemographic characteristics and psychological data of the total sample are shown in Table 1.

The participants, whose ages ranged from 18 to 83 years (mean age = 36.94 ± 15.72), were 67.3 % women ($n = 1037$). More than half of them (51.4 %; $n = 795$) had attained a B.Sc. or M.Sc. degree or postgraduate qualification, and the vast majority reported being in an intimate relationship (68.6 %; $n = 1062$).

Correlation analyses

The results of the bivariate correlations are shown in Table 2.

Age was negatively correlated with all the Dark Tetrad personality traits and with both the TAS-20 total and BES total scores. Gender was positively associated with the Dark Tetrad personalities (with men reporting higher scores than women), whereas it was negatively related with the BES total score (with women reporting higher scores than men). No significant association was found between gender and the TAS-20 total score.

Higher scores on the Dark Tetrad personality traits were all significantly correlated with higher alexithymia scores. Conversely, empathy scores were significantly and negatively associated with the DTDD Machiavellianism and Psychopathy subscale scores and with the SSIS total score. No correlation was found between the BES total and the DTDD Narcissism subscale. A negative correlation was found between the TAS-20 total and the BES total scores.

Table 1
Sociodemographic characteristics and psychological data of the total sample ($N = 1548$).

	Mean (SD)	n (%)	Range
Sociodemographic information			
Age (years)	36.94 (15.72)		18–83
Gender			
Female		1037 (67.3)	
Male		503 (32.7)	
Education			
Primary/Secondary/High school diploma		753 (48.6)	
B.Sc. or M.Sc. Degree/Postgraduate qualification		795 (51.4)	
Marital status			
Single		486 (31.4)	
In a relationship		447 (28.9)	
Cohabitant/Married		615 (39.7)	
Psychological evaluation			
DTDD Machiavellianism	2.99 (3.11)		0–16
DTDD Psychopathy	3.96 (3.13)		0–16
DTDD Narcissism	5.55 (3.64)		0–16
SSIS	15.09 (5.31)		10–47
BES Total	76.49 (9.92)		37–100
TAS-20 Total	45.66 (11.68)		20–83

DTDD = Dark Triad Dirty Dozen; SSIS = Short Sadistic Impulse Scale; BES = Basic Empathy Scale; TAS-20 = Twenty-item Toronto Alexithymia Scale.
Note. Participants indicated the gender they identified with, choosing from three possible answer options: 0 = Female, 1 = Male, and 2 = Other. Only 8 participants selected the option 'Other'; therefore, as this category was not adequately represented, we considered these cases as missing.

Mediation analyses

Three mediation models were tested to assess the possible mediating role of alexithymia in the relationship between the Dark Tetrad personality traits and empathy. Age and gender were included as covariates in all three mediation models.

The first mediation analysis was conducted to examine the effect of the TAS-20 total score in mediating the association between the DTDD Machiavellianism and the BES total score, controlling for age and gender. The results showed both a significant direct effect of DTDD Machiavellianism on the BES total score ($b = -0.311$, $p < 0.001$) and a significant indirect effect of the DTDD Machiavellianism on the BES total score via TAS-20 total score, $b = -0.083$, BCa CI [−0.123, −0.049] (Fig. 1). This suggests that greater Machiavellian traits were associated with lower empathy and higher levels of alexithymia, which in turn were associated with lower empathy.

The second mediation analysis was carried out to examine the effect of the TAS-20 total score in mediating the association between the DTDD Psychopathy and the BES total score, controlling for age and gender. The results showed both a significant direct effect of psychopathy on empathy ($b = -0.931$, $p < 0.001$) and a significant indirect effect of DTDD Psychopathy on the BES total score via TAS-20 total score, $b = -0.089$, BCa CI [−0.131, −0.052] (Fig. 2). This suggests that greater

Table 2
Pearson correlations between socio-demographic variables, Dark Tetrad personality traits, alexithymia, and empathy ($N = 1548$).

	1	2	3	4	5	6	7
1. Age	–						
2. Gender (0 = *F*; 1 = *M*)	−0.01	–					
3. DTDD Machiavellianism	−0.23**	0.19**	–				
4. DTDD Psychopathy	−0.23**	0.24**	0.49**	–			
5. DTDD Narcissism	−0.18**	0.16**	0.57**	0.32**	–		
6. SSIS	−0.09**	0.22**	0.47**	0.40**	0.32**	–	
7. BES Total	−0.07**	−0.38**	−0.17**	−0.36**	0.02	−0.25**	–
8. TAS-20 Total	−0.15**	0.04	0.18**	0.25**	0.12**	0.22**	−0.18**

DTDD = Dark Triad Dirty Dozen; SSIS = Short Sadistic Impulse Scale; BES = Basic Empathy Scale; TAS-20 = Twenty-item Toronto Alexithymia Scale.
* $p < 0.05$; ** $p < 0.01$.
Note. Participants indicated the gender they identified with, choosing from three possible answer options: 0 = Female, 1 = Male, and 2 = Other. Only 8 participants selected the option 'Other'; therefore, as this category was not adequately represented, we considered these cases as missing.

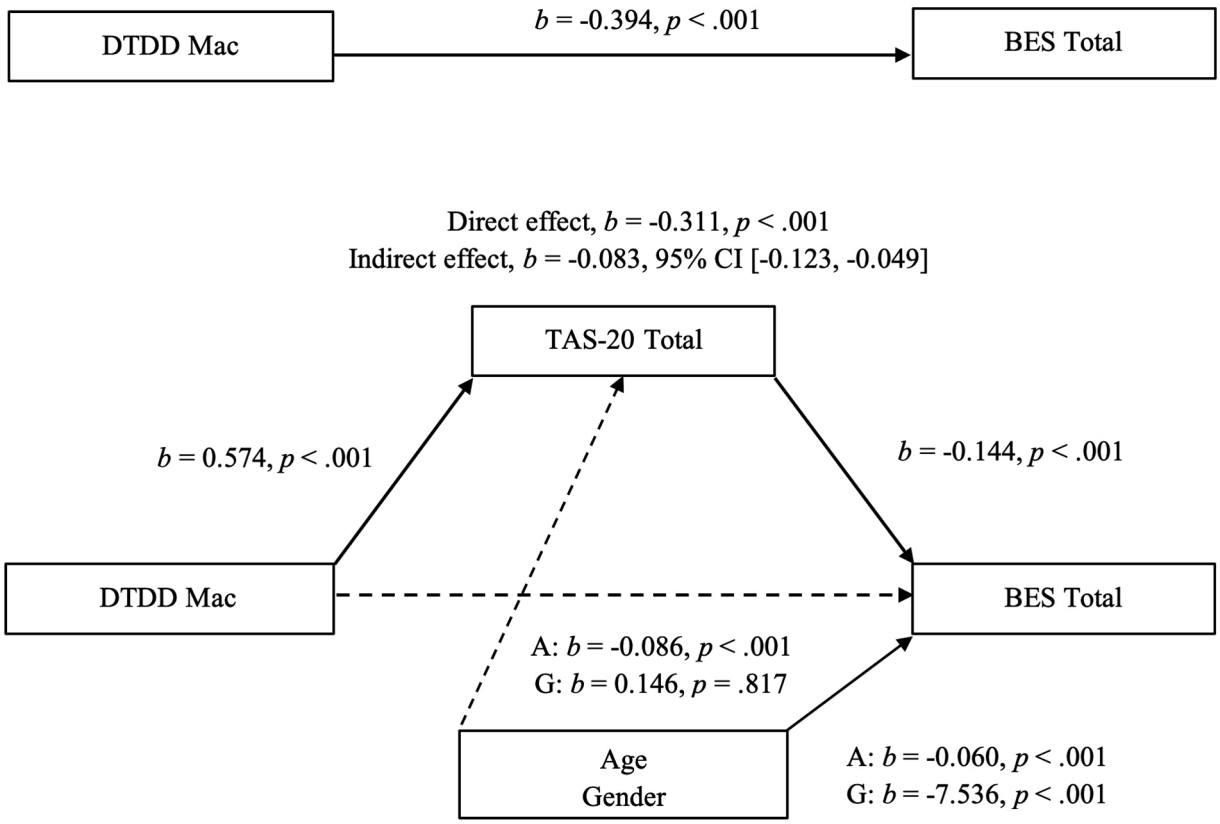

Fig. 1. Model of Machiavellianism (DTDD Mac) as a predictor of empathy (BES Total), mediated by alexithymia (TAS-20 Total) and controlled for age and gender. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.

psychopathic traits were associated with lower empathy and higher levels of alexithymia, which in turn were associated with lower empathy.

The third mediation analysis was conducted to examine the effect of the TAS-20 total score in mediating the association between the SSIS and the BES total score, controlling for age and gender. The results showed both a significant direct effect of sadism on empathy ($b = -0.274$, $p < 0.001$) and a significant indirect effect of SSIS on BES total score via TAS-20 total score, $b = -0.062$, BCa CI [−0.091, −0.037] (Fig. 3). This suggests that greater sadistic traits were associated with lower empathy and higher levels of alexithymia, which in turn were associated with lower empathy.

Discussion

The present study attempted to fill a gap in the literature by examining the potential mediating role of alexithymia in the relationship between each of the Dark Tetrad personality traits and empathy. Indeed, to date, few studies have examined the combined role of empathy and alexithymia in relation to dark personality traits (Burghart and Mier, 2022; Jonason and Krause, 2013; Schimmenti et al., 2019), and none simultaneously considered sadism. The results of our study showed that Dark Tetrad personalities had both a direct and an indirect effect on empathy, with alexithymia emerging as a significant mediator in the relationship between these traits and empathy, even after controlling for the effect of age and gender.

More specifically, the results suggested that empathy and alexithymia play a joint role in relation to three of the four dark personalities, namely Machiavellianism, psychopathy, and sadism. Conversely, narcissism was found to be significantly correlated only with alexithymia, but not with empathy. Past research has suggested a complicated relationship between empathy and narcissism (e.g. Walsh et al.,

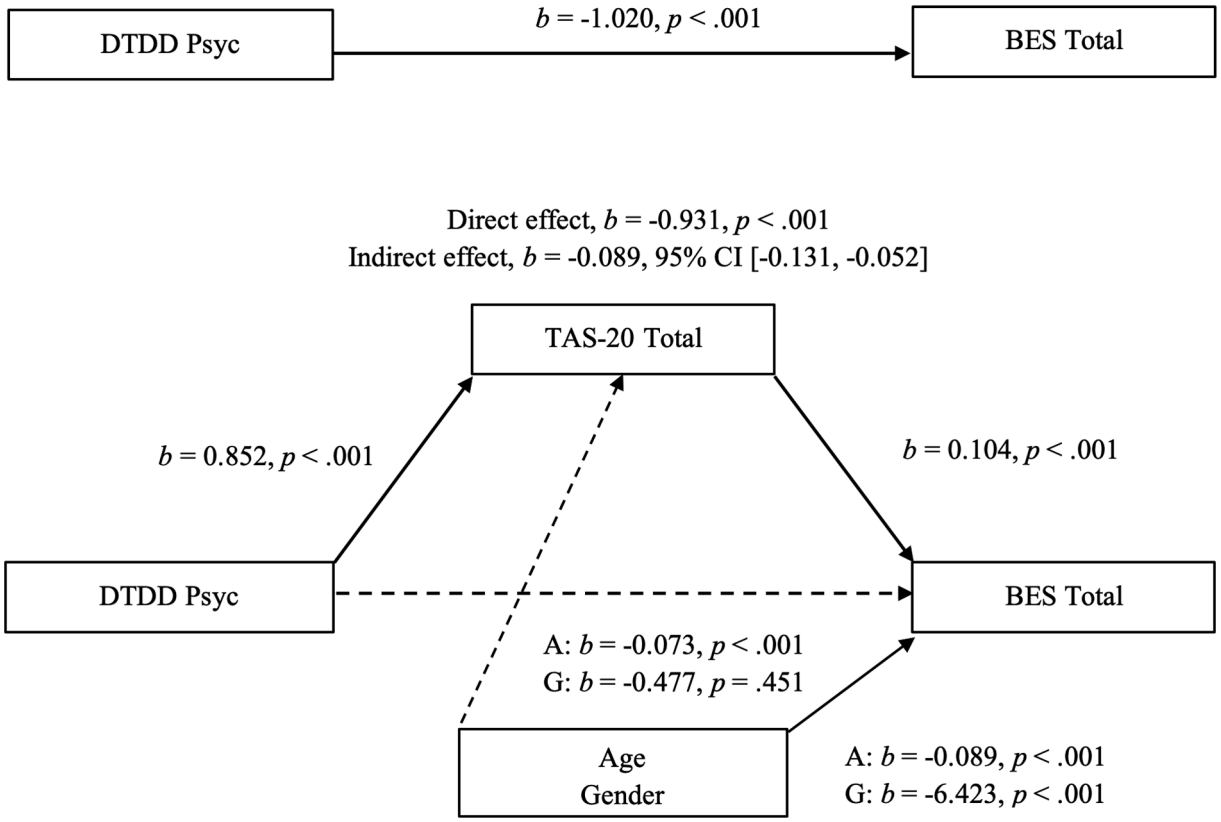

Fig. 2. Model of Psychopathy (DTDD Psyc) as a predictor of empathy (BES Total), mediated by alexithymia (TAS-20 Total) and controlled for age and gender. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.

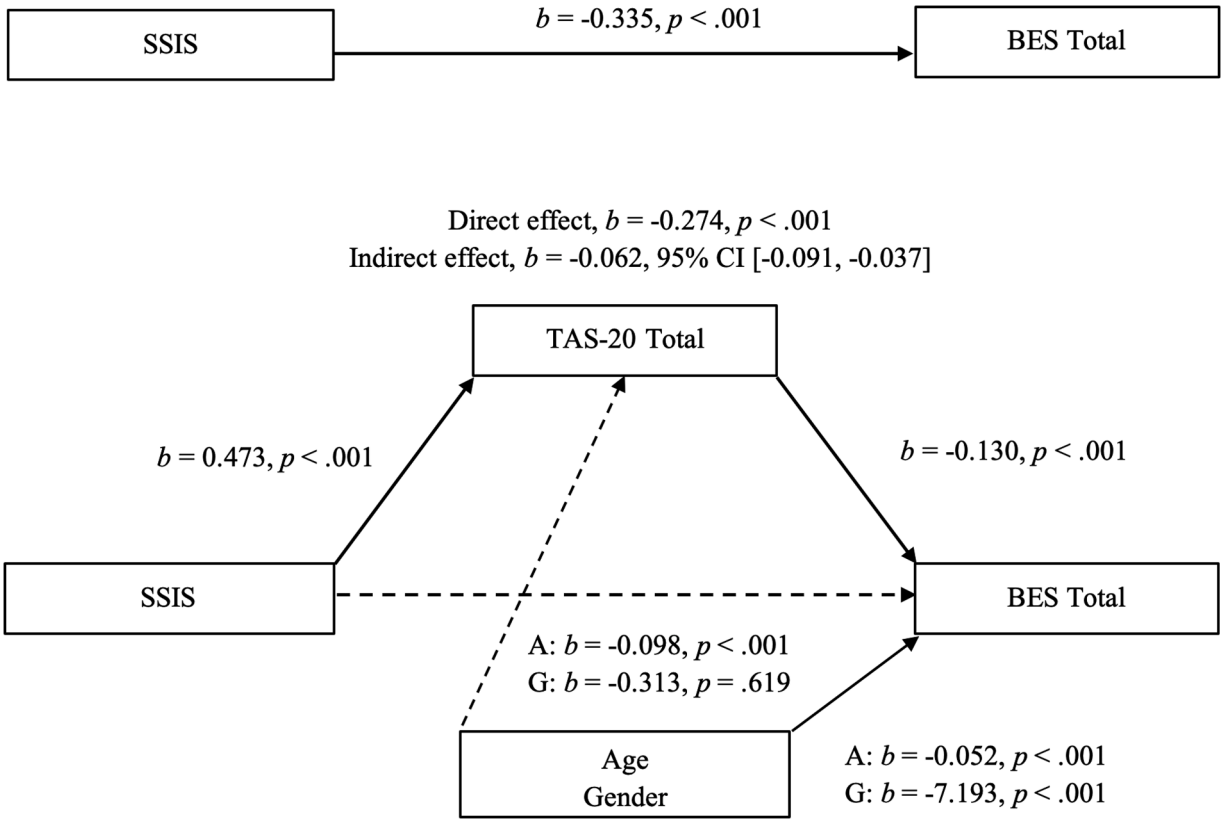

Fig. 3. Model of Sadism (SSIS) as a predictor of empathy (BES Total), mediated by alexithymia (TAS-20 Total) and controlled for age and gender. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.

2021).

These findings are consistent with previous theoretical frameworks on the origins of social and antisocial behaviour (e.g., Baron-Cohen, 2011; Raine, 2013) and other research showing the presence of altered socio-emotional abilities in individuals with Dark Tetrad (or Triad) traits (Burghart and Mier, 2022; Dow and Crawley, 2023; Jonason and Krause, 2013; Schimmenti et al., 2019). For example, the study by Schimmenti et al. (2019) found that Dark Triad traits, particularly Machiavellianism and psychopathy, were significantly associated with increased alexithymia and decreased theory of mind and empathy. Conversely, narcissism was found to be associated only with low empathy, but neither with alexithymia nor with theory of mind (Schimmenti et al., 2019). Similarly, Jonason and Krause (2013) showed on the one hand that increased Machiavellianism and psychopathy scores were significantly correlated with lower empathy skills (both cognitive and affective components) and increased alexithymia levels. However, on the other hand, they found that narcissism was only associated with the difficulty in identifying and describing feelings of the TAS-20 and with cognitive empathy. Finally, the study by Daw and Crawley (2023) revealed that Machiavellianism, psychopathy, and sadism were related to low empathy, whereas no significant correlation was found between narcissism and empathy.

Taken together, these findings seem to show a more uniform trend with regard to Machiavellianism and psychopathy, whereas the evidence for narcissism is more mixed. This pattern of results was further supported by the studies that examined each of the Dark Triad personalities separately (e.g., Al Aïn et al., 2013; Burghart and Mier, 2022; Cairncross et al., 2013; Simard et al., 2023). While increased alexithymia and decreased empathy have been confirmed in Machiavellianism and psychopathy (Al Aïn et al., 2013; Burghart and Mier, 2022), narcissistic traits have also been found to be negatively correlated to alexithymia (Cairncross et al., 2013). One possible explanation for these controversial findings could lie in the prosocial tendencies that narcissistic individuals may exhibit (Konrath and Tian, 2018). However, different motivations for prosocial behaviour can be identified: some more selfless and others more selfish (Batson, 2011). It is assumed that people with high narcissistic traits perform prosocial acts skillfully and tactically in order to increase their reputation or receive something in return (Campbell and Foster, 2007; Konrath and Tian, 2018). Specifically, it is hypothesised that narcissistic individuals may be driven by rewarding experiences associated with high status and power, whereas they may be less motivated by incentives from interpersonal sources, such as close relationships with others (Campbell and Foster, 2007). This may lead narcissistic individuals to seek success and attention to gain narcissistic esteem (e.g. feelings of pride, self-esteem, and dominance), while avoiding developing meaningful social relationships (Konrath and Tian, 2018). According to this view, narcissistic people may tune their socio-emotional skills to achieve these status-related benefits instead of building deep connections with others.

As far as sadism is concerned, little evidence is available regarding the relationship between this personality trait and both empathy and alexithymia, and most research has focused on sexual sadism (Emer and Poepsel, 2021; Kirsch and Becker, 2007). Studies that have examined empathy in everyday sadism are, in fact, limited; however, in line with the present results, they provide support for the presence of negative associations between this personality trait and different empathy components (Buckels et al., 2013; Daw and Crawley, 2023; Pajevic et al., 2018; Velimirović et al., 2018). Conversely, to the best of our knowledge, no previous studies on sadism and alexithymia have been conducted. The findings of this study suggest that individuals with sadistic traits may exhibit high levels of alexithymia, as well as lack of empathy. It might be interesting in the future to examine whether the relationship holds for affective and cognitive empathy separately. Sadism is primarily characterised by a range of cruel or degrading behaviours aimed at asserting dominance or pleasure. This core feature may result in sadistic individuals being unable to access their own and others' emotions, leading to difficulties in adequately recognising their own feelings and those of other people. Future research is needed to corroborate the present pattern of results.

This study is not exempt from limitations. First, a cross-sectional design was used, which does not allow firm conclusions to be drawn about the causality of the relationships among variables. Second, only self-report instruments were used, which may lead to an underestimation of alexithymia or empathy deficits and dark personality traits. This may have been particularly relevant for narcissism in this study, considering both the tendency towards social desirability that these individuals can exhibit, and the multifaceted nature of this construct, with its components that may associate differently with empathy or alexithymia (Simard et al., 2023). Future research should consider the inclusion of multiple measures to comprehensively assess all facets of narcissism and other personality traits, ideally using longitudinal studies with performance-based instruments or structured interviews. Finally, participants were recruited from the general population and included a larger proportion of women and young adults, so these results should be interpreted with caution in light of these sample characteristics. Further research with more heterogeneous and forensic groups is needed to deepen and sustain the present findings.

Conclusion

To our knowledge, the present study represents the first attempt to examine the joint role of alexithymia and empathy in relation to all Dark Tetrad personalities. In fact, previous research investigating alexithymia and empathy together has focused specifically on the Dark Triad, leaving out sadism (Foulkes, 2019; Walker et al., 2021).

This study contributes to the literature by supporting the notion that individuals with high Dark Tetrad personality traits exhibit altered socio-emotional skills, encountering difficulties in identifying and understanding both their own emotions and those of others. Addressing individual differences in alexithymia and empathy through a more targeted approach, along with effective interventions to improve interpersonal relationships, could promote appropriate socio-emotional functioning and reduce the impact of these traits on individuals' social behaviour. Moreover, considering these aspects together, it would be possible to provide a treatment that focuses on improving emotional awareness, with an approach that also takes into account personality traits and avoids the risk of colluding with the patient who exhibits manipulative traits. This is of paramount importance given evidence relating both alexithymia (Veggi et al., 2024) and dark personalities (Edwards et al., 2017) to serious violent crimes against persons.

CRediT authorship contribution statement

Marialaura Di Tella: Conceptualization, Formal analysis, Methodology, Writing – original draft. **Sara Veggi:** Conceptualization, Data curation, Investigation, Writing – original draft. **Agata Benfante:** Conceptualization, Formal analysis, Investigation, Writing – original draft. **Darrick Jolliffe:** Supervision, Writing – review & editing. **David P. Farrington:** Supervision, Writing – review & editing. **Lorys Castelli:** Supervision, Writing – review & editing. **Georgia Zara:** Conceptualization, Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Data availability

Data will be made available on request.

Acknowledgements

The authors would like to thank the participants involved in the study and the thesis students who helped with data collection.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

Al Aïn, S., Carré, A., Fantini-Hauwel, C., Baudouin, J.Y., Besche-Richard, C., 2013. What is the emotional core of the multidimensional Machiavellian personality trait? Front. Psychol. 4, 454. https://doi.org/10.3389/fpsyg.2013.00454.

Albiero, P., Matricardi, G., Toso, D., 2010. La Basic Empathy Scale, uno strumento per la misura della responsività empatica negli adolescenti: un contributo alla validazione Italiana [The Basic Empathy Scale, a measure of empathy in adolescence: a further contribution to the Italian validation]. Psicol. Clin. dello Sviluppo. 14, 205–218.

Baron-Cohen, S., 2011. The Science of evil: On empathy and the Origins of Cruelty. Basic Books.

Baron-Cohen, S., Wheelwright, S., 2004. The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. J. Autism Dev. Disord. 34, 163–175. https://doi.org/10.1023/b:jadd.0000022607.19833.00.

Batson, C.D., 2011. Altruism in Humans. Oxford University Press, New York.

Bonfá-Araujo, B., Lima-Costa, A.R., Hauck-Filho, N., Jonason, P.K., 2022. Considering sadism in the shadow of the Dark Triad traits: a meta-analytic review of the Dark Tetrad. Pers. Individ. Differ. 197, 111767 https://doi.org/10.1016/j.paid.2022.111767.

Bressi, C., Taylor, G., Parker, J., Bressi, S., Brambilla, V., Aguglia, E., Allegranti, I., Bongiorno, A., Giberti, F., Bucca, M., Todarello, O., Callegari, C., Vender, S., Gala, C., Todarello, O., 1996. Cross validation of the factor structure of the 20-item Toronto Alexithymia Scale: an Italian multicenter study. J. Psychosom. Res. 41, 551–559. https://doi.org/10.1016/s0022-3999(96)00228-0.

Buckels, E.E., Jones, D.N., Paulhus, D.L., 2013. Behavioral confirmation of everyday sadism. Psychol. Sci. 24, 2201–2209. https://doi.org/10.1177/0956797613490749.

Burghart, M., Mier, D., 2022. No feelings for me, no feelings for you: a meta-analysis on alexithymia and empathy in psychopathy. Pers. Individ. Differ. 194, 111658 https://doi.org/10.1016/j.paid.2022.111658.

Cairncross, M., Veselka, L., Schermer, J.A., Vernon, P.A., 2013. A behavioral genetic analysis of alexithymia and the Dark Triad traits of personality. Twin Res. Hum. Genet. 16, 690–697. https://doi.org/10.1017/thg.2013.19.

Campbell, W.K., Foster, J.D., 2007. The narcissistic self: background, an extended agency model, and ongoing controversies. In: Sedikides, C., Spencer, S.J. (Eds.), The Self. Psychology Press, pp. 115–138.

Chabrol, H., Bouvet, R., Goutaudier, N., 2017. The Dark Tetrad and antisocial behavior in a community sample of college students. J. Forensic Psychol. Pract. 17, 295–304. https://doi.org/10.1080/24732850.2017.1361310.

Christie, R., Geis, F.L., 1970. Studies in Machiavellianism. Academic Press, New York.

Cohen, J., 1988. Statistical Power Analysis For the Behavioral Sciences, 2nd Ed. Routledge, New York.

Davies, J., & Hand, N., 2003. Sadistic interest: An exploratory study. Paper presented at Division of Forensic Psychology Annual Conference, Cambridge, England.

Decety, J., Lamm, C., 2006. Human empathy through the lens of social neuroscience. Sci. World J. 6, 1146–1163. https://doi.org/10.1100/tsw.2006.221.

Di Tella, M., Adenzato, M., Castelli, L., Ghiggia, A., 2023. Loneliness: association with individual differences in socioemotional skills. Pers. Individ. Differ. 203, 111991 https://doi.org/10.1016/j.paid.2022.111991.

Di Tella, M., Adenzato, M., Catmur, C., Miti, F., Castelli, L., Ardito, R.B., 2020. The role of alexithymia in social cognition: evidence from a non-clinical population. J. Affect. Disord. 273, 482–492. https://doi.org/10.1016/j.jad.2020.05.012.

Dow, G.T., Crawley, H., 2023. Dark Tetrad and empathy: the interrelationship of narcissism, psychopathy, machiavellianism, and sadism with affective and cognitive empathy. Psi Chi J. Psychol. Res. 28 https://doi.org/10.24839/2325-7342.JN28.3.229.

Duradoni, M., Gursesli, M.C., Fiorenza, M., Donati, A., Guazzini, A., 2023. Cognitive empathy and the Dark Triad: a literature review. Eur. J. Investig. Health Psychol. Educ. 13, 2642–2680. https://doi.org/10.3390/ejihpe13110184.

Edwards, B.G., Albertson, E., Verona, E., 2017. Dark and vulnerable personality trait correlates of dimensions of criminal behavior among adult offenders. J. Abnorm. Psychol. 126, 921–927. https://doi.org/10.1037/abn0000281.

Emer, D.R., Poepsel, D.L., 2021. Under the radar: everyday sadism predicts both passive-aggressive harms and beneficial actions after accounting for prosocial tendencies. Pers. Individ. Differ. 168, 110321 https://doi.org/10.1016/j.paid.2020.110321.

Faul, F., Erdfelder, E., Buchner, A., Lang, A.G., 2009. Statistical power analyses using G* Power 3.1: tests for correlation and regression analyses. Behav. Res. Method. 41, 1149–1160. https://doi.org/10.3758/BRM.41.4.1149.

Foulkes, L., 2019. Sadism: review of an elusive construct. Pers. Individ. Differ. 151, 109500 https://doi.org/10.1016/j.paid.2019.07.010.

Fromm, E., 1973. The Anatomy of Human Destructiveness. Basic Books, New York, NY.

Garofalo, C., Virgilio, C., Bogaerts, S., Schimmenti, A., 2019. Dark Ladies: maladaptive Personality Domains, Alexithymia, and the Dark Triad in Women. Clin. Neuropsychiat. 16, 221–228. https://doi.org/10.36131/clinicalnpsych2019050605.

Hayes, A.F., 2009. Beyond Baron and Kenny: statistical mediation analysis in the new millennium. Commun Monogr 76 (4), 408–420. https://doi.org/10.1080/03637750903310360.

Heym, N., Kibowski, F., Bloxsom, C.A., Blanchard, A., Harper, A., Wallace, L., Sumich, A., 2021. The Dark Empath: characterising dark traits in the presence of empathy. Pers. Individ. Differ. 169, 110172 https://doi.org/10.1016/j.paid.2020.110172.

Jolliffe, D., Farrington, D.P., 2006. Development and validation of the basic empathy scale. J. Adolesc. 29, 589–611. https://doi.org/10.1016/j.adolescence.2005.08.010.

Jolliffe, D., Farrington, D.P., 2021. Empathy Versus offending, Aggression and Bullying: Advancing Knowledge Using the Basic Empathy Scale. Routledge/Taylor & Francis Group. https://doi.org/10.4324/9780429287459.

Jonason, P.K., Krause, L., 2013. The emotional deficits associated with the Dark Triad traits: cognitive empathy, affective empathy, and alexithymia. Pers. Individ. Differ 55, 532–537. https://doi.org/10.1016/j.paid.2013.04.027.

Jonason, P.K., McCain, J., 2012. Using the HEXACO model to test the validity of the Dirty Dozen measure of the Dark Triad. Pers. Individ. Differ 53, 935–938. https://doi.org/10.1016/j.paid.2012.07.010.

Jonason, P.K., Webster, G.D., 2010. The dirty dozen: a concise measure of the Dark Triad. Psychol. Assess. 22, 420–432. https://doi.org/10.1037/a0019265.

Jones, D.N., Figueredo, A.J., 2013. The core of darkness: uncovering the heart of the Dark Triad. Eur. J. Pers 27, 521–531. https://doi.org/10.1002/per.1893.

Judge, T.A., Piccolo, R.F., Kosalka, T., 2009. The bright and dark sides of leader traits: a review and theoretical extension of the leader trait paradigm. Leadersh. Q. 855–875. https://doi.org/10.1016/j.leaqua.2009.09.004.

Kirsch, L.G., Becker, J.V., 2007. Emotional deficits in psychopathy and sexual sadism: implications for violent and sadistic behavior. Clin. Psychol. Rev. 27, 904–922. https://doi.org/10.1016/j.cpr.2007.01.011.

Konrath, S., Tian, Y., 2018. Narcissism and prosocial behavior. In: Hermann, T., Brunell, A., Foster, J. (Eds.), Handbook of Trait Narcissism: Key Advances, Research Methods, and Controversies. Springer, New York.

Le Berre, A.P., 2019. Emotional processing and social cognition in alcohol use disorder. Neuropsychol 33, 808. https://doi.org/10.1037/neu0000572.

Morf, C.C., Rhodewalt, F., 2001. Expanding the dynamic self-regulatory processing model of narcissism: research directions for the future. Psychol. Inq. 12, 243–251. https://doi.org/10.1207/S15327965PLI1204_3.

O'Meara, A., Davies, J., 2022. The Short Sadistic Impulse Scale. Shining Light on the Dark Side of Personality: Measurement Properties and Theoretical Advances 184.

O'Meara, A., Davies, J., Hammond, S., 2011. The psychometric properties and utility of the Short Sadistic Impulse Scale (SSIS). Psychol. Assess. 23, 523–531. https://doi.org/10.1037/a0022400.

Pajevic, M., Vukosavljevic-Gvozden, T., Stevanovic, N., Neumann, C.S., 2018. The relationship between the Dark Tetrad and a two-dimensional view of empathy. Pers. Individ. Differ. 123, 125–130. https://doi.org/10.1016/j.paid.2017.11.009.

Parker, J.D., Keefer, K.V., Taylor, G.J., Bagby, R.M., 2008. Latent structure of the alexithymia construct: a taxometric investigation. Psychol. Assess. 20, 385–396. https://doi.org/10.1037/a0014262.

Paulhus, D.L., 2014. Toward a taxonomy of dark personalities. Curr. Dir. Psychol. 23, 421–426. https://doi.org/10.1177/0963721414547737.

Paulhus, D.L., Williams, K.M., 2002. The Dark Triad of personality: narcissism, machiavellianism and psychopathy. J. Res. Pers. 36, 556–563. https://doi.org/10.1016/S0092-6566(02)00505-6.

Raine, A., 2013. The anatomy of Violence: the Biological Roots of Crime. Pantheon/Random House.

Schimmenti, A., Jonason, P.K., Passanisi, A., La Marca, L., Di Dio, N., Gervasi, A.M., 2019. Exploring the dark side of personality: emotional awareness, empathy, and the Dark Triad traits in an Italian sample. Curr. Psychol. 38, 100–109. https://doi.org/10.1007/s12144-017-9588-6.

Shapiro, I.D., 1981. Autonomy and Rigid Character. Ronald, New York, NY.

Simard, P., Simard, V., Laverdière, O., Descôteaux, J., 2023. The relationship between narcissism and empathy: a meta-analytic review. J. Res. Pers. 102, 104329 https://doi.org/10.1016/j.jrp.2022.104329.

Taylor, G.J., Bagby, R.M., Parker, J.D., 2003. The 20-Item Toronto Alexithymia Scale: IV. Reliability and factorial validity in different languages and cultures. J. Psychosom. Res. 55, 277–283. https://doi.org/10.1016/s0022-3999(02)00601-3.

Thompson, D.F., Ramos, C.L., Willett, J.K., 2014. Psychopathy: clinical features, developmental basis and therapeutic challenges. J. Clin. Pharm. Ther. 39, 485–495. https://doi.org/10.1111/jcpt.12182.

Veggi, S., Benfante, A., Di Tella, M., Roveta, F., Castelli, L., Zara, G., 2024. Intimate partner violence and alexithymia: do emotions matter? A systematic review and meta-analysis. Trauma Violenc. Abuse 25, 2521–2534. https://doi.org/10.1177/15248380231217045.

Velimirović, M., Bojanić, M., Dinić, B., 2018. Cognitive empathy distinguishes sadism from psychopathy: effects on antisocial behaviour. Empir. Stud. Psychol. 50, 38.

Wai, M., Tiliopoulos, N., 2012. The affective and cognitive empathic nature of the dark triad of personality. Pers. Individ. Differ. 52, 794–799. https://doi.org/10.1016/j.paid.2012.01.008.

Walker, S.A., Double, K.S., Birney, D.P., 2021. The complicated relationship between the Dark Triad and emotional intelligence: a systematic review. Emot. Rev. 13, 257–274. https://doi.org/10.1177/17540739211014585.

Walsh, J., Krienert, J., McAdams, S., 2021. A retrospective examination of bullying victimisation during high school. In: Jolliffe, D., Farrington, D.P. (Eds.), Empathy Versus Offending, Aggression & Bullying. Routledge, London, pp. 211–223. https://doi.org/10.4324/9780429287459.

Wertag, A., 2023. Empathy and Dark Personalities. IntechOpen. https://doi.org/10.5772/intechopen.107446.