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RESEARCH ARTICLE

THE EFFECTS OF THE DARK TETRAD OF PERSONALITY BY GENDER ON ANIMAL ABUSE:
A MODERATION ANALYSIS**Aikaterini Faratzi¹, Konstantinos Christos Daoulitzis², Georgios Pilafas^{2,3}, Penelope Louka^{2,4}**

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Abstract

Background: The field of psychology has classified negative and antisocial behaviors in humans under the term "Dark Tetrad," which includes Machiavellianism, Narcissism, Psychopathy, and Sadism. Numerous studies have provided evidence of a significant association between the Dark Tetrad traits and both human maltreatment and violent behaviors. Among these violent behaviors, animal abuse is a prevalent form that has been shown to predict other types of abuse. The present study aims to investigate the connection between the Dark Tetrad traits and animal abuse, while also examining the potential moderating effect of gender.

Method: A total of 243 participants, consisting of 106 men (43.6%) and 137 women (56.4%) and ranging in age from 18 to 55, Greeks living in Greece, were recruited for this study. Data collection was conducted online, where participants provided their demographic information and completed two scales: the Dark Tetrad scale and the animal abuse scale.

Results: The findings of the study revealed a significant association between all Dark Tetrad traits and animal abuse, which supports previous research. Furthermore, the analysis showcased a moderating influence of gender, whereby the three Dark Tetrad traits (Narcissism, Psychopathy, Sadism) exhibited a stronger predictive effect on animal abuse for men compared to women.

Conclusion: The study concludes that all Dark Tetrad traits can predict animal abuse, especially in men, except Machiavellianism, which does not show significant gender differences. Future research should consider controlling the confounding effects of domestic violence and investigate the indirect impact of the Dark Tetrad traits on such behaviors.

Keywords: Dark Tetrad of Personality, animal abuse, moderation analysis.

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INTRODUCTION

Individual differences and personality traits governed by both biological and environmental factors¹ shape human behavior. Of the many personality traits identified and relevant models proposed, the Dark Tetrad of personality traits has been a topic of great interest in psychological research. These traits have been associated with a range of negative outcomes, including harmful behaviors towards others.² One form of such harmful behavior is animal abuse, which has been recognized as a potential precursor to future acts of violence and abuse against vulnerable populations.³ However, despite the apparent correlation between these two variables, there is a dearth of published research that comprehensively examines the link between dark personality traits and animal abuse. Understanding how the Dark Tetrad traits, in conjunction with gender, influence the likelihood of engaging in animal abuse can provide valuable insights into the psychological mechanisms behind such behaviors. This study aims to explore the interactive effects of the Dark Tetrad of personality by gender on animal abuse, employing a moderation analysis approach to shed light on this complex relationship.

The main personality traits outlined by the "Big Five" model are conscientiousness, agreeableness, openness, extraversion, and neuroticism.⁴ These traits serve as the foundational elements for the development of the Dark Triad, which encompasses the dark and antisocial aspects of the Big Five.⁵ Specifically, the Dark Triad comprises Machiavellianism, Psychopathy, and Narcissism. During the past decades, extensive research has established a strong association between Dark Triad personalities and a wide range of negative and delinquent behaviors.⁶ Furthermore, these personalities have been linked to various clinical disorders.⁷ It is worth noting that the emergence of Dark Triad traits, as all personality traits, can be attributed to either environmental factors or genetic predispositions.⁸ Consequently, individuals may possess these traits from birth or develop them throughout their lives. The Dark Triad framework serves as a means to elucidate and predict antisocial behaviors such as violence, sexual harassment, and unethical conduct.⁹

The development of the Dark Triad (Machiavellianism, Psychopathy, and Narcissism) emerged because of increased interest in

dark personality traits in recent decades¹⁰. First, Machiavellianism is characterized by traits such as manipulation, deceit, fraud, and a strategic calculative orientation.¹¹ Those exhibiting Machiavellian tendencies employ cunning and deception to acquire power. While Machiavellians may be viewed as advantageous in certain contexts, most of the time their behavior can cause irreparable damage to those around them.¹² Individuals possessing Machiavellianism traits, easily forging social relationships, meticulously planning their actions, cultivating a favorable reputation, and exploiting those around them for personal gain, with little regard for the detrimental consequences they impose on others' lives. Secondly, Psychopathy is characterized by a lack of restraint and limited emotions.¹³ Individuals exhibiting psychopathic traits display superficial emotions, grandiosity, high intelligence, a notable absence of remorse and empathy, impulsivity, and problematic behavior.¹⁴ The key features associated with psychopathy include a penchant for thrill-seeking, lack of empathy, impulsive behavior, and indifference to consequences. Although individuals with psychopathy may possess certain advantages in certain dangerous or stressful occupations, they are usually avoided due to their proclivity for spiraling out of control and engaging in criminal behavior.¹⁵ Lastly, Narcissism shares certain commonalities with Machiavellianism and Psychopathy, as it is mainly characterized by cruelty and manipulation.¹⁶ However, it diverges from the other two dark personality traits by encompassing vanity, grandiosity, insecurity, self-importance, underlying vulnerability, and increased sense of entitlement.¹⁶ Narcissists believe that they are exceptional individuals deserving admiration from those around them. Individuals with narcissistic traits have advantages in leadership roles or competitive environments. Nevertheless, they often experience lack of personal fulfillment and tend to create destructive relationships with those around them.¹⁷

Utilizing the Dark Triad as its foundation, the Dark Tetrad was subsequently introduced, incorporating an additional dark personality trait, Sadism, due to the notable similarities it shares with Dark Triad behaviors.¹⁸ Sadism is characterized by an individual's enjoyment derived from inflicting cruelty upon other living beings. Sadists exert dominance through engaging in degrading, cruel, and harmful behaviors.¹⁹ Sadism can be classified

into two categories, direct and indirect. In direct sadism, an individual takes pleasure in actively causing pain to others, either through their behavior or through acts of aggression. In contrast, indirect sadism involves deriving pleasure from observing the suffering of others without directly participating in it. Sadists pose a significant threat to those around them, as they struggle to control their desires. Furthermore, they also inflict harm upon themselves, often facing legal consequences and struggling to form healthy relationships with others.²⁰

The Dark Tetrad traits have been consistently associated with abusive and delinquent behaviors, as mentioned earlier. One such behavior is animal abuse, a pervasive global issue that inflicts unbearable suffering upon innocent creatures.²¹ As defined by Ascione (1993), animal abuse encompasses "*all socially unacceptable behavior that intentionally causes unnecessary pain, suffering or distress and/or death to an animal*".²² Such behavior includes acts such as using objects or hands to strike the animal hitting the animal with objects or hands, kicking, throwing the animal onto objects or parts of buildings, inflicting stab wounds, burns, grabbing the animal by the tail, administering poisons or drugs and engaging in sexual abuse.²³ While hitting or kicking animals may be the most common forms of abuse, it is important to note that sexual assault on animals is equally abusive, often resulting in severe physical harm and even death for the animal involved.²⁴

Research supports the notion that incidents of animal abuse are most prevalent in childhood and adolescence, with a general decline in abusive behavior towards animals as individuals age.²⁵ It has also been argued that adults who engage in animal abuse tend to exhibit repeated incidents of such behavior, consciously and systematically, in contrast to children who may engage in animal abuse infrequently or randomly. However, it is noteworthy that the earlier a child becomes involved in animal abuse, the greater the likelihood that they will continue to abuse animals throughout their lives. This can be attributed to the influential role of early learning, which significantly shapes an individual's future behaviors.²⁶ Additionally, hidden dark aspects of their personality may also play a role, potentially manifesting more prominently during adulthood.

Apart from age, gender also appears to influence the manifestation of animal abuse, although it should be noted that studies in this area may be biased. Most research examining the connection between animal abuse and violent, aggressive, and criminal acts has primarily focused on male populations, increasing the need to investigate these phenomena also in women. Even so, the findings strongly indicate that almost 2/3 of individuals who engage in animal abuse have a history of perpetrating violent crimes.³⁰ Moreover, men who abuse animals tend to exhibit abusive behavior towards vulnerable individuals, such as children, women, and the elderly. It is also worth noting that a significant proportion of individuals involved in animal abuse are also implicated in criminal activities, such as drug-related offenses, human trafficking and acts of violence.³¹ It is remarkable that many murderers have documented incidents of animal abuse during the early stages of their criminal behavior.³² Furthermore, there exists a direct correlation between a person's criminal behavior, including rape, murder, and aggression, and their involvement in animal abuse.³³ This connection has been established through childhood histories of numerous violent criminals, who exhibited extreme forms of abuse towards both domesticated and wild animals, thereby initiating their abusive behavior with animals and later extending it towards humans.³⁴ As mentioned before, previous studies predominantly focus on the male population, positing that males display higher rates of abusive behavior compared to females. However, it is important to acknowledge that there are studies supporting similar rates of animal abuse between males and females, attributing the specific behavior to mental disorders³⁵ or past experiences of abuse trauma endured by the perpetrators.³⁶ Studies have consistently shown that men demonstrate higher rates of animal abuse compared to women³⁸, while women, through their interactions with animals, can experience emotions that they may have been deprived of or struggle to experience.³⁹ These findings suggest a gender disparity in animal abuse³⁹, with men displaying higher rates of such behavior, while women tend to prioritize the welfare and well-being of animals⁴⁰. Additionally, there is a positive correlation between men's abuse of animals and their propensity for violent behavior towards women.⁴¹ This correlation along with the finding that individuals who exhibit violence towards

their partners may also engage in violent behavior towards animals due to lack of empathy³⁷, implies that men who engage in animal abuse may also be prone to mistreating women, and vice versa.

Despite the existence of common patterns in the display of animal abuse, it is important to recognize that there are numerous individual differences among perpetrators. Research indicates that the motivations behind animal abuse can vary significantly among individuals. Some individuals may engage in animal abuse out of curiosity or a sense of excitement, while others do so with the intention of causing harm or inflicting pain.⁴² Furthermore, animal abuse may serve as a means for satisfying the sadistic instincts of the abuser, such as intimidation, terror, isolation, punishment, revenge, control and manipulation of the animal.⁴³ These sadistic inclinations align with the characteristics exhibited by individuals with Dark Tetrad personalities, which can partially rationalize the presence of abusive behavior towards animals.¹⁰

There is a robust body of literature that explores the relationship between animal abuse and dark personality traits.⁴⁴ Extensive observations indicate that individuals who engage in animal abuse have a history of interpersonal violence and antisocial behavior, including incidents of aggression towards other human beings.⁴⁵ Furthermore, additional predictors of animal abuse include a lack of empathy⁴⁶, as mentioned before, neuroticism and low conscientiousness,⁴⁷ which are highly associated with aggression and violence.⁴⁸ These traits are suggestive of the Dark Triad, which has been linked to aggression and violent behavior.⁴⁹ Research suggests that individuals with Dark Triad personalities tend to exhibit their negative behaviors, such as manipulation, intimidation, coercion, violence, and deception, towards those closest to them, often targeting individuals who are vulnerable or weaker.⁵⁰ This pattern extends to their treatment of animals, whereby they derive pleasure from subjecting animals to humiliation and fear⁵¹, with the underlying goal of exerting control and power over something more defenseless.⁵² It is important to note that these behaviors encompass not only physical abuse but also psychological abuse, which can have a more profound impact on the animal's well-being compared to phys-

ical harm.⁵³ Psychological abuse of an animal can lead to consequences such as aggression, depression, malnutrition, and even death. Despite the awareness of the detrimental effects associated with such abuse, research in this area remains limited.⁵⁴ Despite the findings that establish a connection between the Dark Triad and animal abuse, this study opted for the Dark Tetrad model, as it encompasses Sadism, which is characterized by emotional detachment and apathy, and has also demonstrated a close association with animal abuse linking. While Sadism has been closely linked to Psychopathy, its distinct feature lies in deriving pleasure from the suffering and pain of others.⁵⁵ Furthermore, it has been argued that children who engage in animal abuse are likely to exhibit behavioral problems in the future, as their cruel actions during childhood indicate early signs of contempt and lack of empathy, which are indicative of Sadism.⁵⁶ In summary, numerous studies have reported associations of animal abuse with Dark Tetrad core traits such as antisocial behaviors, the perpetrator's pleasure derived from others' suffering, the infliction of pain, lack of empathy, cruelty, manipulation, and apathy⁵¹, attributing them to factors such as gender, personality and dysfunctional family backgrounds.⁵⁹ Researchers have widely characterized animal abuse as a predictor of individuals' inclination towards delinquent and abusive acts, including domestic violence⁶⁰, partner abuse⁶¹, terrorism and bullying⁶², and sexual abuse⁶³. Most research supports the link between low levels of narcissism and high levels of extroversion with the protection and support of animals⁶⁵, and the link between high levels of positive emotions and sensitivity with caring and tenderness towards animals⁶⁴. Conversely, high levels of manipulation and hostility are associated with abusive behavior towards animals.⁶⁶ Therefore, animal abuse may be an important predictor of various abusive and delinquent behaviors. Beyond being a criminal act, animal abuse is also ethically unjustifiable, further supporting the necessity of conducting the present study.

The current study

This paper aims to examine the association between the Dark Tetrad and animal abuse, focusing on the influence of individual Dark Tetrad personalities and considering the role of gender. Despite sounding scarce, statistical surveys conducted over the

past two decades have revealed a concerning reality. In Wales and England, the Royal Society for the Prevention of Cruelty to Animals received approximately 150,000 complaints regarding animal abuse.²⁵ Shockingly, out of these complaints, only 3,870 resulted in the conviction of the perpetrators, representing a mere 3% of the total complaints. Similar rates have been observed in the USA and Australia²⁶, indicating a widespread issue. Despite the collective efforts of animal welfare communities and the implementation of legal measures taken to safeguard animals in recent years, the number of reported animal abuse cases increased significantly in 2021, reaching 1,081,018 complaints.²⁷ Astonishingly, only 751 convictions were secured against the abusers.²⁷ These alarming statistics suggest that a significant number of individuals engage in animal abuse, while only a fraction of them face legal consequences for their actions intensifying the need for conducting the present study.

The existing literature demonstrates shared characteristics between Dark Tetrad personalities and animal abuse, including manipulation, callousness, and a notable absence of empathy.⁶⁷ These traits have consistently been associated with abusive behavior. Furthermore, the presence of Psychopathy and Sadism has been specifically linked to such behavior.² Among the Dark Tetrad behaviors, Psychopathy stands out as the one most strongly associated with animal abuse, particularly acts such as torturing, injuring, or killing animals for no apparent reason other than to inflict pain⁵⁷. Apart from Psychopathy and Sadism, high levels of Narcissism are also exhibited in individuals with abusive and antisocial behavior, including animal abuse.⁵⁸ The aforementioned findings indicate that certain Dark Tetrad personality traits can serve as predictors of animal abuse. By identifying these predictors, we can take preventive measures to address and understand this behavior in the Greek population. This study was specifically selected due to the ongoing rise in animal abuse complaints, the scarcity of literature on causal factors in animal abuse, and the absence of research examining the relationship between the Dark Tetrad and animal abuse.

Hence, based on the literature findings, the main hypothesis of the study was "*Higher levels of Machiavellianism, higher levels of Psychopathy, higher levels of Narcissism and higher levels of Sadism will predict higher levels in abusive behavior towards animals,*

depending on gender. As a result, it is anticipated that the impact of Machiavellianism, Psychopathy, Narcissism, and Sadism will be greater in males compared to females".

METHODOLOGY

Ethics

The study was approved by the Ethic Committee of the School of Psychology at the Mediterranean College in Athens, Greece and the University of Derby in the UK and conducted in accordance with the Declaration of Helsinki.

Design

In the present research, a correlational between-subjects' study was applied. The independent variables were the Dark Tetrad of Personality -Machiavellianism, Psychopathy, Narcissism and Sadism- (all scale variables, ranging from 1 to 5) and the dependent variable was animal abuse (scale variable, ranging from 1 to 5). The moderator variable was gender (nominal, male: 1, female: 2).

Participants

A total of 243 participants were included in the survey, by applying the snowball sampling technique. Of these participants, 106 (43.6%) participants were males, and 137 (56.4%) participants were females. Mean participants' age was 27.32 ($SD = 14.91$), ranging from 18 to 55 years old. All participants were Greeks living in Greece. People under 18, suffering from mental disorders and people who have suffered mental or physical abuse, with or without an official diagnosis, were excluded from the research.

Materials

Demographic questions (gender, age, country of origin, place of living) and two questionnaires measuring variables were used to conduct the survey. For the Dark Tetrad of Personality, the SD4 was used⁶⁸ and for animal abuse the P.E.T. scale.⁶⁹

Short Dark Tetrad (SD4). The SD4 is a widely used 28-item scale for assessing Dark Tetrad personalities. It contains the four Dark Tetrad personalities (Machiavellianism, Narcissism, Psychopathy, and Sadism) and responses are collected via a 5-point Likert scale (1 = "*Strongly disagree*", 5 = "*Totally agree*"). The scale is divided into four subscales of 7 items. The average score

of each subscale measures the possible presence of the corresponding personality of the Dark Tetrad in each participant, with 1 as the absolute lack of the specific personality and 5 as the total presence of the specific personality. The four subscales of the SD4 have good psychometric properties. SD4 shows internal reliability with Cronbach's alpha values ranging from .78 to .83 in the four subscales.⁶⁸ In the present study, the internal consistency was found also acceptable (Machiavellianism: $\alpha = .78$, Psychopathy: $\alpha = .82$, Narcissism: $\alpha = .83$, Sadism: $\alpha = .82$) while the four-structure of the tool was confirmed (Total variance explained: 65.68%, eigenvalues ranging from 1.14 to 3.82).

The Physical and Emotional Tormenting animals scale (P.E.T. scale). The P.E.T. is a 9-point scale for assessing harness abuse. Responses are collected via a 5-point Likert scale (1 = "Never", 5 = "Very often"). Mean scale scores measure each participant's animal abuse behavior, with 1 being the absolute absence of the specific behavior and 5 being the total presence of the specific behavior. Psychometric analyzes of the scale show validity for the scale items and adequate internal reliability with Cronbach's alpha values ranging from .69 to .84.⁶⁹ In the present study, the internal consistency was found also acceptable ($\alpha = .84$) while the tool was confirmed unidimensional (Total variance explained: 61.18%, eigenvalue: 4.65).

Procedure

The data collection took place from December 2022 to June 2023. The tools were administered online via the Google Forms platform. The research process started with providing participants with general information about the study's topic ("A study investigating the link between personality traits and certain behaviors") and instructions. Afterwards, participants indicated their consent to participate and filled in a personal participation number to ensure anonymity. Participants were then asked to complete their demographic information. The Dark Tetrad questionnaire (SD4) was the first questionnaire completed by participants, followed by the animal abuse scale (PET scale). Upon completion of the questionnaires, participants were provided with a debriefing sheet and were thanked for their participation. Finally, participants were given the contact information of the researcher and research supervisor in case they wished to with-

draw their data within a specified period (two weeks) or had further inquiries. The average participation time was 15 minutes.

Analytic Strategy

Using G*Power version 3.1.9.6, a priori power analysis was performed⁷⁰ to determine the minimum sample size for multiple regression analysis (deviation from 0). The requested properties were f^2 (effect size) = 0.15, Power = .95 and alpha level = .05. A sample size of 138 was obtained, which is nearly double the intended number of participants for this study. As a result, it was not anticipated that there would be any Power issues (Type II error) in this study. Data analysis was performed using the program IBM SPSS Statistics, version 28. Initially, data screening techniques were conducted (normality: based on skewness and kurtosis cut-off points and after visual inspection of Q-Q plots, outliers: identified by boxplots and z-scores, linearity, and homoscedasticity: visual inspection of scatterplots). After finding that parametric assumptions were met (see relevant section in Results), the Pearson's correlation analysis was then performed to test the relationship between the Dark Tetrad traits and animal abuse. Finally, four moderation analyses were conducted using the Process macro extension⁷¹ (Model 1). In each analysis, one of the Dark Tetrad traits served as the independent variable, animal abuse as the dependent variable and gender as the moderator. The effect size (f^2) was calculated using the formula proposed by Cohen (1988) for multiple regression analysis with moderation: $F^2 = R^2 / 1 - R^2$. According to Cohen's guidelines, effect sizes of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively.⁷² In all analyses, the alpha level was 0.05 (95% confidence intervals).

RESULTS

Data screening

Initial data screening tests showed the distribution of Machiavellianism, Narcissism, Psychopathy, and animal abuse was slightly skewed (see Table 1) based on the 1.96 threshold, as proposed by Field.⁷² However, the distribution was assumed to be normal based on Kim (2013), who argues that an absolute z value below 3.29, which corresponds to an alpha level of .05, implies that the sample distribution is normal for medium-sized samples ($50 < n < 300$).⁷³ Overall, these tests showed that the

assumptions of normal distribution, homoscedasticity and linearity were met. No outliers and missing values were detected.

Correlations among the study variables

Table 2 shows Pearson's correlation results. All independent variables (Dark Tetrad traits) were found to be positively correlated, even though weakly, with animal abuse. In more detail, there was a strong positive correlation between Machiavellianism and animal abuse ($r_{233} = .22, p = .001$), a strong positive statistical correlation between Narcissism and animal abuse ($r_{233} = .18, p = .004$), a strong positive statistical correlation between Psychopathy and animal abuse ($r_{233} = .21, p = .001$) and a strong positive statistical correlation between Sadism and animal abuse ($r_{233} = .22, p = .001$). All correlations between the Dark Tetrad traits were found positive, medium to large, and significant at 0.01 level ($.55 < r_{233} < .73, p < .001$).

Standard regression analyses for the total sample

In Table 3, the results of the standard multiple regression analysis are displayed. In addition to the initial data screening, additional tests were conducted to examine autocorrelation and multicollinearity. The Durbin-Watson test indicated no presence of autocorrelation, with a value of 1.98. Furthermore, the Variance Inflation Factor (VIF) showed no evidence of multicollinearity, as all VIF values were below 2.41. These results ensure the reliability and validity of the conclusions drawn from the analysis. The prediction model reached significance ($F_{4,238} = 196.75, p < .001$), explaining the 80% of the variation in the variable of animal abuse ($R^2 = .808, R^2_{adj} = .804$).

More specifically, all independent variables were found to positively predict animal abuse: (a) Machiavellianism ($B = 0.32, t_{238} = 5.49, p < .001$), (b) Narcissism ($B = 0.17, t_{238} = 3.09, p = .002$), (c) Psychopathy ($B = 0.26, t_{238} = 3.91, p < .001$) and (d) Sadism ($B = 0.29, t_{238} = 4.16, p < .001$). All coefficients predicted an increase of between 0.17 and 0.32 units in the dependent variable of animal abuse. In summary, these results suggest that the Dark Tetrad personality traits predict the animal abuse.

Moderation analyses

To investigate each independent variable with gender as moderator variable, four simple moderation analysis were performed using the PROCESS command (Model 1). Table 4 displays the

overall results. In accordance with the relevant literature, the effect of Machiavellianism on animal abuse was not moderated by gender, even though the interaction was marginally statistically significant ($B = -1.78, 95\% CI [-0.06, 3.62], t = 1.90, p = .058$). On the other hand, Narcissism was found to be significant ($B = 4.01, 95\% CI [-2.08, 5.96], t = 4.08, p = .001$), indicating that the effect of Narcissism on animal abuse is moderated by gender. Further investigation of the moderation effect revealed that Narcissism is more important and positive predictor for men ($B = 3.23, 95\% CI [1.73, 4.73], t = 4.25, p < .001$) than for women ($B = 0.79, 95\% CI [-0.45, 2.02], t = 1.26, p = .210$). The same was found also for Psychopathy, as its effect on animal abuse was moderated by gender ($B = 2.69, 95\% CI [0.71, 4.67], t = 2.68, p = .008$). Further investigation of the moderation effect revealed once more that Psychopathy is more important and positive predictor for men ($B = 1.80, 95\% CI [0.28, 3.31], t = 2.34, p = .020$) than for women ($B = 0.89, 95\% CI [-0.39, 2.17], t = 1.37, p = .171$). Lastly, the effect of Sadism on animal abuse was moderated by gender, as did for Narcissism and Psychopathy ($B = 3.49, 95\% CI [1.33, 5.66], t = 3.16, p = .001$). Again, Sadism was found a more important and positive predictor for men ($B = 2.61, 95\% CI [0.85, 4.37], t = 2.92, p = .003$) than for women ($B = 0.89, 95\% CI [-0.38, 2.15], t = 1.38, p = .170$).

Based on the results of the standard multiple regression and moderation model, it appears that while Machiavellianism, Narcissism, Psychopathy, and Sadism are recognized as significant factors associated with animal abuse, there are gender differences in their impact. More specifically, Machiavellianism affects both men and women equally, whereas the other Dark Tetrad traits hold more predictive value for animal abuse in men compared to women.

Overall model statistics for (a) Machiavellianism X Gender: $R^2 = .87, F_{3,239} = 529.15, p < .001$, (b) Narcissism X Gender: $R^2 = .88, F_{3,239} = 569.24, p < .001$, (c) Psychopathy X Gender: $R^2 = .87, F_{3,239} = 538.52, p < .001$ and (d) Sadism X Gender: $R^2 = .87, F_{3,239} = 546.17, p < .001$.

DISCUSSION

Research findings have demonstrated that individuals' engagement in abusive and delinquent behaviors can be predominantly

attributed to their underlying personality and character traits.⁷⁴ The pleasure derived from the mistreatment of others has been linked to specific traits such as Machiavellianism, Narcissism, Psychopathy, and Sadism.^{75,76,77} Additionally, abusive behavior is frequently directed towards vulnerable beings, including children and animals, who are unable to defend themselves adequately.⁷⁸ Therefore, it is of great significance to conduct thorough investigations to uncover the personality traits associated with each form of abuse, as the consequences of such mistreatment can be severe, even leading to fatalities. Despite the gravity of these issues, animal abuse persists as a prevalent occurrence with both individual and societal ramifications.

The research findings indicate a substantial predictive capacity of the Dark Tetrad traits in relation to the escalation of animal abuse, as reflected by a notably high overall effect size ($f^2 = 3.86$). While each Dark Tetrad trait exhibits considerable effect sizes, Machiavellianism ($f^2 = 2.49$) and Sadism ($f^2 = 2.47$) demonstrate the highest magnitude, followed by Psychopathy ($f^2 = 2.06$), and Narcissism ($f^2 = 1.95$) with the smallest yet still significant effect size among the traits. These findings underscore the significant influence of the combined presence of the four Dark Tetrad traits on the amplification of animal abuse. Moreover, individual traits also exert notable effects, with Sadism and Machiavellianism typically serving as the primary influencers in the increase of animal abuse. These results strongly support the existing literature, which posits that Machiavellianism, Narcissism, Psychopathy, and Sadism serve as predictive factors for animal abuse.

These findings align with prior research that has established a connection between individual Dark Tetrad traits and instances of animal abuse.⁴⁴ They are further supported by studies indicating that individuals who engage in animal abuse often have a history marked by violent, aggressive, and antisocial behaviors that are directly linked to Psychopathy.^{45,48} Moreover, previous research has emphasized the role of Sadism on animal abuse, highlighting the propensity of individuals characterized by tendencies to coerce, manipulate, deceive, and intimidate to perpetrate violence against vulnerable creatures.⁵⁰ The defenseless nature of animals, coupled with their inability to resist or protect themselves, may enhance the gratification experienced

by the abusers. These factors contribute to the prevalence of animal abuse cases, as animals represent easy targets lacking sufficient safeguards. The apathy, callousness and cruelty exhibited by individuals who perpetrate animal abuse align with the manifestations of Sadism, Machiavellianism and Narcissism, as supported by previous studies identifying these traits as predictive factors for violent acts.^{49,51}

The findings of this study provide further support for previous research investigating the relationship between Dark Tetrad traits and acts of violence and abuse, with animal abuse being a prevalent form of such violence.³⁷ While previous studies have often emphasized the pronounced effects of Sadism and Psychopathy on violence due to their inherent lack of empathy, the present study reveals that Sadism and Machiavellianism exert a stronger influence on animal abuse. Research has consistently linked Psychopathy to various forms of violence and delinquency, including animal abuse.⁵⁷ Additionally, empirical evidence indicates that sadism is a prevalent characteristic among abusers, as it offers a sense of pleasure derived from directly inflicting pain on the victim.⁵⁵ Furthermore, Machiavellianism is characterized by behaviors associated with abusive behavior towards animals, such as manipulation and hostility.⁶⁶ In contrast, narcissism is associated with violence and abuse due to the indifference and contempt narcissists harbor towards others, indirectly contributing to abuse.⁶⁵

Lastly, the present study revealed that gender indeed has a moderating effect on the relationship between the Dark Tetrad traits and animal abuse. The overall findings support the research hypothesis that men exhibit a stronger association between Dark Tetrad traits and animal abuse compared to women. Even though, a positive relationship between all Dark Tetrad traits and animal abuse was observed both in men and women (showed by the standard multiple regression model), this effect is moderated by gender. These results are consistent with prior research indicating higher rates of animal abuse among men compared to women³⁸, as well as the presence of lower levels of violent personality traits in women than men.³⁹ In summary, men and women differ in the prevalence of negative personality traits and the occurrence of animal abuse.

Limitations and recommendations for future studies

Despite the systematic organization and methodological approach employed during the research, certain limitations were identified upon its completion that could have been mitigated. While the online survey method was adopted to ensure participant anonymity and honesty, it has faced criticism due to the possibility that hinders spontaneous responses and the uncertainty surrounding the conditions in which participants provide their answers.⁷⁹ To address this concern in future studies, the inclusion of also data collected "*offline sampling*" and their subsequent comparison to those obtained online could be considered, for promoting spontaneous responses, and minimizing premeditated answers. Furthermore, the utilization of the Animal Abuse Scale (PES) in this research involved sensitive questions regarding abusive acts, which potentially discouraged some participants who had engaged in animal abuse from responding truthfully.⁸⁰ Additionally, a large portion of participants was recruited before, during, and after the Christmas holidays, which may have influenced participants' responses, leading to more optimistic and lenient answers. During this period, individuals often do not experience their usual routines and exhibit heightened positive emotions. Conducting the research during a more neutral period would have been preferable. Finally, a slightly different approach could be implemented in future studies, by incorporating the Dark Tetrad traits as independent variables, animal abuse as mediator and domestic violence as the dependent variable, is recommended, given the observed association between animal abuse and cases of domestic violence.⁶⁰

PRACTICAL IMPLICATIONS AND CONCLUSION

Given the gravity of these issues, it is crucial to undertake comprehensive research aimed at identifying and disclosing the specific personality traits associated with each type of abuse.⁸¹ Understanding these associations can enhance our knowledge of the underlying mechanisms and risk factors involved, thereby facilitating the development of targeted prevention and intervention strategies.^{82,83} Despite growing awareness, animal abuse remains a prevalent and persistent phenomenon with both individual and social implications.⁸¹ Efforts to address this issue must

involve multidisciplinary approaches that encompass legal measures, public education, and psychological interventions to promote empathy, compassion, and responsible attitudes towards animals.^{81,84} By comprehensively addressing the complex interplay between personality traits, abusive behaviors, and their consequences, society can work towards creating a safer and more compassionate environment for all living beings.⁸⁵ In conclusion, this research aimed to examine the association between Dark Tetrad traits and animal abuse. The Dark Tetrad traits, namely Machiavellianism, Narcissism, Psychopathy, and Sadism, have been consistently linked to violent and abusive behaviors. The findings of this study suggest that the specific characteristics encompassed within the Dark Tetrad can predict the occurrence of animal abuse, as a manifestation of individual behaviors. The traits constituting the Dark Tetrad are characterized by negative, violent, and abusive tendencies, which are exhibited through transgressive and cruel acts against vulnerable creatures. Previous research has established a connection between negative and aggressive personality traits and the perpetration of animal abuse, whereas positive personality traits and higher levels of positive emotions have been associated with caring, tenderness, and protectiveness towards animals. Furthermore, it has been proposed that animal abuse serves as a predictor for other forms of abuse and delinquent behaviors, thereby impacting both humans and society at large.

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ANNEX

TABLE 1. Descriptive statistics of the study variables

	Mean	SD	Min	Max	Skewness	Kurtosis
<i>Dark Tetrad traits</i>						
Machiavellianism	2.75	0.81	1	4.43	-1.17	-2.53
Narcissism	2.57	0.75	1	4.00	-0.89	-2.53
Psychopathy	2.37	0.73	1	3.86	-0.31	-2.06
Sadism	2.42	0.72	1	3.88	-0.76	-1.45
Animal abuse	2.37	0.79	1	3.89	-0.93	-2.17

Note. *N* = 243.**TABLE 2.** Correlation coefficients for the study variables

Variables	1.	2.	3.	4.	5.
<i>Dark Tetrad traits</i>					
1. Machiavellianism	-				
2. Narcissism	.55***	-			
3. Psychopathy	.64***	.57***	-		
4. Sadism	.68***	.61***	.73***	-	
5. Animal abuse	.22**	.18**	.21**	.22**	-

Note. *N* = 243. ****p* < .001, ***p* < .01

TABLE 3. Regression coefficients of Machiavellianism, Narcissism, Psychopathy and Sadism on Animal Abuse

Predictors	B	SE	95% CI		p
			LL	UL	
Intercept	-0.25*	0.10	-0.44	-0.05	.012
Machiavellianism	0.32***	0.06	0.20	0.43	<.001
Narcissism	0.17**	0.06	0.06	0.28	.002
Psychopathy	0.26***	0.07	0.13	0.39	<.001
Sadism	0.29***	0.07	0.15	0.43	<.001

Note. N = 243. CI = confidence interval; LL = lower limit; UL = upper limit. *** p < .001, ** p < .01, *p < .05.

TABLE 4. Effects of Machiavellianism, Narcissism, Psychopathy and Sadism on animal abuse by gender

Effects	B	SE	95% CI		p
			LL	UL	
Machiavellianism X Gender	1.78	0.94	-0.06	3.62	.058
Narcissism X Gender	4.01***	0.98	2.08	5.96	<.001
Psychopathy X Gender	2.69***	1.00	0.71	4.67	<.001
Sadism X Gender	3.49***	1.01	1.33	5.66	<.001

Note. N = 243. CI = confidence interval; LL = lower limit; UL = upper limit. *** p < .001.