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The Relationship Between Animal Abuse and Aggressive Types of Behaviour According to the Dark Tetrad of Personality traits

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ABSTRACT

The present study examines the relationship between animal abuse and types of aggressive behaviour and the moderating role of the Dark Tetrad personality traits (Machiavellianism, Narcissism, Psychopathy, Sadism) in this relationship. 200 participants participated in the study, which completed three standardised assessment measures for animal abuse, aggression and Dark Tetrad personalities. The correlation studies showed a high positive correlation between animal abuse and aggressive behaviours where effect sizes showed predictive validity, physical aggression (r= 0.807), verbal aggression (r= 0.787), anger (r= 0.770) and hostility (r= 0.813). Narcissism served as a significant factor that strengthened the link between animal abuse and hostility according to moderation analysis yet its effects were not substantial for other aggressive behaviours. Machiavellianism, Psychopathy, and Sadism also did not show significant moderation effects on any aggressive behaviour. The research data supports past investigations which demonstrate animal mistreatment functions as a general predictor of physical violence yet demonstrates intricate connections between personality traits. The study contains important limitations because it depends on participant self-reporting and features specific design characteristics and restricted cultural and age demographics. Future research with expanding culturally and age ranges in the sample, using longitudinal approaches, is recommended. The research outcomes suggest that interventions must address empathy training while focusing on specific social education concerning abuse reduction.

Keywords: Animal abuse, Physical aggression, Verbal Aggression, Anger, Hostility, Dark Tetrad

INTRODUCTION

Individual personality traits determine individual behaviours. According to biology, each individual's personality develops based on individual differences, resulting in the formation of the uniqueness of human character and behaviour (Smith, 1982). Psychological empirical research suggests that dark personality traits were significantly associated with abusive behaviours (Ireland et al., 2019), such as animal abuse and aggression (Beirne, 2004). However, there is no published research demonstrating the relationship between dark

personality traits, animal abuse, and aggression.

Aggression

The research on aggression continues to evolve among neuroscience psychologists and sociologists because this complicated behaviour demonstrates various distinct behavioural aspects. The various symptoms of aggression manifest as either physical acts of aggression, verbal aggression, hostility, or anger (Anderson & Bushman, 2018). The various elements have specific influence upon interpersonal connections and community dynamics together with personal psychological health status. Aggression functions beneficially during specific situations, but it often causes much harm, such as violence along with psychological problems that cause social problems (Archer & Coyne, 2005). Aggression occurs when someone demonstrates physical or psychological harmful actions towards others (Krahé, 2020). There are many forms of aggression because aggression does not always have the same characteristics. Different forms of aggression manifest with specific characteristics that produce different results. Harmful behaviour through physical violence characterises physical aggression that includes the actions of hitting and kicking, as well as the use of weapons. Physical aggression occurs more often in males in early developmental stages due to biological as well as social elements (Tuvblad & Baker, 2019). Physical aggression continues into adulthood, especially when people lack impulse control and grow up in dangerous environments. A person displays verbal aggression when they attack others with abusive communication through verbal means such as hostile language, threats, and insults. Verbal aggression allows long-term psychological symptoms to develop that include anxiety, depression, and reduced self-esteem (Coyne et al,. 2020). Hostility is a long-term negative attitude, which is accompanied by resentment and distrust of other people. A state of hostility increases the likelihood of acts of aggression only during times when someone is faced with what they perceive as a challenge (Miller et al., 2020). Research has proven that hostile people suffer health complications which create heart problems, while also intensifying mental distress (Smith et al., 2021). Anger causes emotional reactions when individuals perceive uncertain threats or face unfair situations or failed expectations. The feeling of anger itself does not create aggression, but it usually signals the upcoming appearance of aggressive behaviour (Perez, 2023). Those who successfully manage their anger turn their negative emotions into helpful solutions for problems. On the other hand, individuals struggling with anger regulation expressions will display aggressive conduct. Expressions of aggression result from biological influences in combination with psychological aspects. Throughout the last ten years, Neuroscientists have identified natural biological processes responsible for brain-based aggression regulation (Nelson & Trainor, 2007). Scientists indicate that the amygdala functions together with the prefrontal cortex as essential components for creating aggressive behaviours. Aggressive responses from threat processing inside the amygdala get controlled through impulsive behaviour regulation by the prefrontal cortex (Blair, 2024). The brain region shows dysfunction, which increases the chance of aggressive behaviour, particularly among people who show antisocial personality traits. Among the factors that produce aggressive behaviour are hormones (Batrinos, 2012). In males, testosterone induces physical aggression, but this behaviour shows variability based on social and environmental factors (Eisenegger et al., 2017). Low levels of serotonin have been directly associated with uncontrollable impulses and aggressive behaviours (Seo et al., 2020). Aggression develops according to the General Model of Aggression (GEM) through the connection between environmental factors (e.g. frustration or provocation) and personal

characteristics (e.g. personality traits or established experiences) (Krahé, 2020). Individuals learn aggressive behaviours from social learning theory through observation and reinforcement processes. Exposure to aggressive behaviour among family members or through screen media leads children to become more violent in their actions (Coyne et al., 2020).

Individual aggression is regulated through participation in cultural and social activities. Culture-based norms determine which aggressive behaviours are acceptable and social organisation systems determine the frequency of these behaviours. Research evidence confirms that males display physical aggression more than females, while females exhibit tendencies towards verbal aggression and relational aggression (Archer, 2019). Cultural pressures that exist in societies influence gender patterns of aggression. Societies that avoid physical aggression by women tend to see increased use of social exclusion and gossip as expressions of aggressive behaviour (Hess & Hagen, 2021). Digital communication technologies have changed the way people engage in aggressive behaviour. Virtual aggression through cyberbullying has raised great concerns among researchers and authorities. Social media provides people with opportunities for aggressive speech hidden behind anonymity to create hostile interactions online (Brailovskaia et al., 2021). Different cultural values determine both aggressive expression and interpretive behaviour. Aggressive behaviours tend to be suppressed in collectivist societies that value group harmony because people adopt passive-aggressive approaches (Guan et al., 2019). Individualistic cultures demonstrate tolerance for direct confrontations and verbal expressions of aggression as social norms.

Aggression produces numerous damaging effects, which impact people in their individual life, social groups and their romantic relationships. The continuous aggression is linked with increased vulnerabilities to co-morbid depressive disorders, besides anxiety and substance use disorders (Smith et al., 2021). Also, the person with a higher level of hostility and anger indicates a higher cardiovascular disease risk (Miller et al., 2020). The performance of aggressive behaviours creates damage to interpersonal connections that leads to social separation along with conflicts and obstacles to success in professional life and personal environments (Coyne et al., 2020). Research shows that extensive exposure to verbal aggression has negative effects on personal self-esteem along with the deterioration of emotional health. Aggression acts as a major factor leading to the development of violent behaviour, criminal activities, and social unrest throughout the community. High levels of aggression lead to increased rates of violence in both society and the family (Archer, 2019). Maladaptive aggressive behaviours have been demonstrated to be corrected using effective therapy and putting in place cognitive-behavioural interventions (CBT) (Perez, 2023), structured anger-management programmes (Blair, 2024) and community-based programmes (Eisenegger et al., 2017).

The formation of aggression results from a combination of biological factors, psychological elements and social elements. Physical or verbal expressions show aggression as people gain short-term advantages from it which result in emotional problems and fractured interpersonal relationships on both individual and societal levels. The systematic knowledge of varied displays and cause of aggressions will continue being indispensable in coming up with interventions that cut down damage in society.

Animal abuse

Animals suffer widespread abuse, which shows evidence of multiple factors within society, as well as patterns of culture and psychological development. Recently scientists have achieved notable progress in examining animal abuse through detailed research into varying abuse types and

reasons behind mistreatment as well as the extensive social effects (Ascione, 2001). Research studies define animal abuse as the intentional or negligent acts of inflicting harm and pain, along with suffering, on animals (Ascione et al., 2018). The modern world has made significant progress in raising awareness of animal rights, while multiple reports of animal abuse continue to exist worldwide. This unethical behaviour towards animals serves as social markers and helps to identify wider sociological patterns that cause harm. Research reveals that when animals become victims of abuse communities often experience increased violence, which might initiate additional cases of personal violence (Miller et al., 2020).

The practice of animal abuse consists of physical mistreatment and neglect in which both human-inflicted physical violence and insufficient animal care come into play. Neglect remains the most dangerous form of animal abuse because it becomes difficult to detect when it occurs in domestic settings, along with dysfunctional family relationships (Johnson et al., 2019). Animals suffer welfare decline because the animal husbandry system densifies their accommodation while subjecting them to hazardous environments in pursuit of profit. Similarly, animals both in research and entertainment are also subject to a similar set of welfare concerns since economic factors often tend to override animal welfare (Jenkins & Rudd, 2022). Psychological abuse based on social isolation and exposure of animals to persistently stressful environments seriously compromise their welfare. Chronic stress leads to behavioural and physiological disorders in animals due to emotional abuse (Beck, 2022). It is necessary for research to combine multiple disciplines to study animal abuse because psychological components along with social elements join economic factors and cultural aspects as root causes. Scientific evidence shows that people who target animals with abusive behaviours tend to have antisocial traits or unresolved psychological problems (Thompson & Gullone, 2006). Studies suggest that when a person mistreats animals, it could signal the presence of personality disorders as well as the potential for violence against people (Miller et al., 2020). Some people express cruelty to animals to gain control in situations where they lack power, as a problematic way of managing their emotions. A combination of poor economics with social unrest causes increased occurrences of harmful behaviour towards animals. Insufficient resources along with inadequate education about animal care led to increased neglect and cruelty to animals in poverty-stricken communities. Animal abuse is unintentionally propagated through traditional cultural practices and economic systems in specific societies (Stephen, 2020). The way people relate to animals depends largely on the cultural beliefs of their society. Local communities that treat animals as property, along with their use for work and food, may accept abuse as acceptable. The implementation of animal protection legislation reduces cases of abuse directly (Jenkins & Rudd, 2022).

Animals suffer severe consequences from abuse that spill over into entire communities to influence human behaviour following incidents of animal abuse (Ascione & Arkow, 1999). The effects of animal abuse produce multiple consequences that flow from community to community and ultimately influence human behavioural patterns. Animal abuse causes animals to suffer significant physical and psychological harm (Arkow, 2021). Numerous years of stress together with untreated medical conditions and untreated injuries decrease both life expectancy and overall well-being of animals. Animal abuse also causes public health complications because zoonotic diseases spread when neglect occurs in unclean environments (Johnson et al., 2019). Research studies have shown that animal abuse is directly linked to incidents of violence between people. Research suggests that animal abusers exhibit higher risk factors for attacking people, so some

experts consider animal cruelty as an indicator that individual abusers may develop violent behaviours in the future (Miller et al., 2020). Animal abuse damages social values and contributes to the creation of a violent social environment beyond its immediate consequences. Society suffers from weakened social fabric and ethical decline because offenders avoid punishment for abuse-related crimes (Ascione et al., 2018). The research and institutional community is working to resolve animal abuse through a combination of legislative changes and enforcement (Jenkins & Rudd, 2022) as well as education (Beck, 2022), expert-multiplied approaches, and community-based programs (Stephen, 2020).

Animal abuse develops from many different behavioural and social factors in society along with cultural and psychological patterns that expose fundamental problems in the community. In this context, animals are subjected to both physical attacks and inadequate care in private homes and institutions. Animal abuse causes effects that go beyond the suffering of the animals because it causes increased community violence along with destructive changes in human behaviour and social norms. The solution requires coordinated efforts between research, legislation, educational campaigns, and community programs that promote knowledge about the prevention of abuse in order to shape an ethical society.

Dark Tetrad of Personality

Researchers study the "dark" personality traits through psychology, as they want to analyze harmful patterns in the way people interact with each other. Academics have centred their research on the Dark Triad construct, which consists of narcissism together with Machiavellianism and psychopathy. However, through recent research that added sadism as an additional trait, the Dark Tetrad has been created (Međedović & Petrović, 2015). Researchers are currently studying the Dark Tetrad as a collection of personality traits that link narcissism, Machiavellianism, and psychopathy, while also sharing sadism as a separate element (Buckels et al., 2014). These interpersonal traits share elements of insensitivity along with egocentrism. New research has shown the need to distinguish between these personality traits because they predict different sets of outcomes (Jones & Paulhus, 2013). Research indicates that sadistic behaviour is its own psychological concept, which creates special predictive utility in research (Buckels et al., 2013). The inclusion of sadistic elements within the triad demonstrates elements not captured by the basic triad. The field of personality research has advanced in its development, including new destructive behaviours (Miller & Lynam, 2012). Grandiosity along with a sense of entitlement is combined with a need to receive excessive admiration as core characteristics of narcissistic behaviour. Although narcissism can exhibit helpful qualities in some situations, its most destructive form results in a weakened self-image along with the ruthless treatment of other people (Miller & Campbell, 2011). Studies in recent years have examined the self-promotional behaviours used by narcissists to hurt others by misinterpreting feedback in conjunction with their negative reactions to criticism (Jones & Paulhus, 2013). Research suggests that narcissism causes great personal harm, especially when there is overconfidence in leadership or organisational settings, because it creates poor choices and distorts ethical behaviour. The personality trait of Machiavellianism involves the use of deliberate strategy while maintaining a gloomy outlook on life along with the pursuit of personal success without adhering to ethical principles (Jonason & Tost, 2010). Machiavellianism has been the subject of a large number of empirical studies, linking it to strategic deception in both professional and personal life. Research results have revealed that Machiavellianism is used to predict individuals who intend to manipulate their social relationships through exploitation of

others, particularly in competitive settings (Muris et al., 2017). The trait does not appear as the explicit display of aggressive behaviour, because it exists as a set of intentional designs towards other people.

Psychopathy disorder includes three core traits that include impulsive traits, but also a lack of empathy, and engaging in antisocial actions. Research currently suggests that psychopathy-specific traits from the Dark Tetrad lead to workplace crime and unacceptable behaviour (Thibault & Kelloway, 2020). Social maneuvering is often an element of narcissism and Machiavellianism, however psychopathy exhibits direct action and overrides established social norms. Research shows that this personality trait leads people to more aggressive and risk-taking behaviour (Buckels et al., 2014). Research findings published through meta-analysis demonstrate that psychopathy serves as a leading indicator of violent behaviour, so that early recognition and intervention measures are of great importance. Sadism is the last trait of Dark Tetrad, defining the feeling of pleasure when harming others. The behavioural pattern of sadism can be observed in modern life through games and bullying (Frischlich et al., 2023). A growing number of studies over the past ten years have shown that sadists exhibit antisocial behaviour while exhibiting reduced empathy abilities that intensify the antisocial effects of their other traits (O'Boyle et al., 2018). The research findings demonstrate how everyday situations express cruelty discreetly which eventually results in improper workplace responses and unorthodox deviant social behaviours.

The number of psychometric instruments aimed at Dark Tetrad personality assessment has expanded quickly since 2010. The Short Dark Tetrad (SD4) scale has received improvements in reliability for accurately assessing Dark Tetrad traits in clinical and nonclinical sample populations (Jones & Paulhus, 2013). Research findings validate the SD4 scale because it measures a variety of social and clinical outcomes that include interpersonal aggression alongside organisational unethical behaviour (Muris et al., 2017). The meta-analytic research has unified results obtained from different populations studies performed over the last decade. Different Dark Tetrad traits vary in their shared components but independently affect workplace deviance and criminal conduct together with relationships challenges (Walker et al., 2021). Research suggests that a measure of sadism predicts enjoyment of others' pains, something that is not possible with psychopathy assessment alone (O'Boyle et al., 2018; Yin et al., 2023).

New theoretical models exploring the complexity of antisocial behaviour have emerged due to the incorporation of sadism into the concept of dark personality. According to Jones & Paulhus (2013), the model establishes that narcissism, along with Machiavellianism and psychopathy, drives selfish behaviour and manipulation, but sadism represents the emotional basis that allows for pleasure from hurting others (Jones & Paulhus, 2013). By analyzing this model researchers learned the reason behind the varying levels of cruel conduct that exists between two individuals who share equivalent levels of callousness and manipulation. Sociological models confirm that environmental situations along with unique elements of the environment stimulate the realisation of different elements of the Dark Tetrad traits (Davis & Vaillancourt, 2023). A business race and strict rules tend to trigger Machiavellian modus operandi and personal disputes, in particular, are likely to induce psychopathic behaviour and narcissistic tantrums. Researchers have intensively studied how dark personality traits interact with environmental factors because such examination creates stronger explanations of how dark traits manifest practically (O'Boyle et al., 2018). The study of the Dark Tetrad continues to expand although many fields of research have criticised its methods. The role of incorporating everyday sadism into research is subject to scientific

debate and creates confusion, due to actions that should be defined as abnormal (Paulhus & Dutton, 2016). The authors caution against over-medicalising normal life behaviours, as it can create misunderstandings and stigmatisation when identifying socially unacceptable behaviour (Muris et al., 2017). A number of scholars reject Dark Tetrad studies because testing methods based on self-reporting face high sensitivity to biased information provided by study participants.

Harmful behaviour research centers on the Dark Tetrad consisting of Narcissism together with Machiavellianism Psychopathy and Sadism as major traits. This model assumes the existence of distinctive dysfunctional behaviour patterns based on the characteristics, which result in unequal impacts on workplace behaviours, interpersonal relationships as well as aggressiveness. Research on the Dark Tetrad enables predictions about antisocial conduct while helping develop intervention approaches although it needs detailed knowledge about variables that affect these characteristics. The field requires additional attention to both measurement issues and concerns about behavioural overdiagnosis in order to develop appropriate methods for classifying harmful interpersonal patterns.

Aggression and animal abuse

Studies over the previous decade reveals animal abuse start the pattern of aggressive conduct, which extends further than cruelty towards animals. Children who experience animal violence or cruelty in early childhood tend to learn this behaviour as normal through social learning (Albert, 2017). The current trend of violent behaviour indicates that animal abuse is not only a precursor but also strengthens the etiology of the more general process (Faratzi et al., 2024). Observing or participating in animal abuse tends to reduce human sensitivity to violence resulting in reduced demands for aggressive behaviour directed at people (Alleyne & Parfitt, 2017). Personal factors such as personality traits along with attitudes interact with situational variables such as stress or provocation through the General Model of Aggression to generate aggressive responses. Individuals who have been taught aggressive behaviours through exposure to violent interactions, such as animal abuse will portray tendencies of aggression (Buckels et al., 2013). Pre-existing aggressive tendencies along with animal abuse play a role in reinforcing aggressive states that can be applied in a variety of other contexts. Deficits in empathy operate in parallel with moral disengagement processes which serve as main pathways for animal abuse to lead to aggressive behaviour (Parkes & Signal, 2017). When people lack empathy for others, they feel no restraint when inflicting pain, whether on animals or human beings. Through moral disengagement techniques that involve dehumanisation along with rationalisation of cruelty, these people are able to carry out abusive actions without experiencing guilt (Blair, 2018). Research indicates violent criminals show similar psychological characteristics of animal abusers, which suggests all share equivalent psychological patterns.

Multiple recent empirical studies have produced significant evidence that animal abuse causes individuals to become more aggressive (Nurse, 2016). Animal abuse research includes evidence on personality traits, behavioural influences and environmental influences. Higher scores on dark personality measures correspond to greater aggressive behaviour including animal cruelty, thus validating that animal abuse is part of antisocial behaviours (Muris et al., 2017). Dark personality traits identified from both the aggression and animal abuse domains demonstrate significant predictive abilities for antisocial actions in social and organisational settings (O'Boyle et al., 2018). The sociocultural environment and distinct personality characteristics maintain the strongest influence over this connection between animal mistreatment and aggressive conduct. The treatment of animal abuse

through legal systems and cultural norms of countries influence the increase or decrease of aggressive behaviour. Societies that do not grant animals any legal rights as property develop poor moral frameworks that allow animal cruelty and increase rates of violence towards animals and people (Jenkins & Rudd, 2022). Identifying the relationship between animal abuse and aggression raises key priorities for implementing new approaches to ending these behaviours. The identification of manifestations of aggressive behaviour in the vulnerable population, which demonstrates sadistic treatment of animals, can serve as an impending sign of interpersonal violence in the future (Banwell, 2023).

Research shows that animal abuse is a critical warning sign for the development of future violence because children learn such behaviour by observing others in their social environment. Abusive behaviour reduces empathy and weakens moral control, allowing a violent pattern to become a shared pattern between humans and animals. Animal cruelty along with dark personality traits forms a powerful connection that requires immediate action through early detection of aggression towards animals, which serves as a warning sign for violent behaviour. Such prevention strategies need to address both societal views and legal structures since both factors are critical to develop compassion for people and animals.

Dark Tetrad of Personality and aggression

Studying personality types, which produce aggressive conduct, became the main focus of research in recent years. Researchers have largely focused on the Dark Tetrad of personality as an established conceptual model. According to Buckels, Jones, and Paulhus (2013), sadism functions as an independent component for violent behaviour, thus indicating an accumulation of dark traits that leads to aggressive tendencies (Buckels et al., 2013). Individuals exhibit aggressive tendencies because they possess specific personality traits along with temporal situational stimuli. The General Model of Aggression (GAM) shows how dark personality traits along with external factors lead individuals to exhibit aggressive behaviour (Berkowitz, 2018). In recent years, various approaches have been investigated that relate dark personality traits to aggressive behaviour (Furnham, 2022). All of the traits embodied in the Dark Tetrad category indicate an extreme lack of empathy. Psychopathy in relation to everyday sadism shows a direct connection with underdeveloped emotional capacities to understand and feel the feelings of our fellow human beings (Bonta & Andrews, 2023; O'Connell, D., & Marcus, 2019). These include feelings, which also burden the common physical resistance that prevents anyone from harming others. The absence of empathy together with insufficient remorse acts as an indication that people will use both reactive and organic aggression (Girard et al., 2019). A narcissistic person often explodes when their self-esteem is threatened. In contrast, someone with psychopathy may act impulsively, with no concern at all for the consequences it causes to other people (Khodabakhsh & Besharat, 2011). Sadism explains the ways in which people derive satisfaction from harming others (Buckels et al., 2014).

Numerous studies in the last decade have pointed to empirical relationships between dark personality traits and various types of aggression. The research has established that everyday sadistic tendencies lead to physical and verbal aggression because people who enjoy hurting others tend to show higher aggressive behaviours (Buckels et al., 2014). Furthermore, research that extended the conceptual framework of the Dark Triad to sadism has been able to provide an even more powerful predictor of aggressive and antisocial outcomes (Jones & Paulhus, 2013). In other studies, dark traits are noted to present some risks of either becoming aggressive or having an increased likelihood to act violently (Muris et al., 2017). In connection with outcomes at

the work place, dark personality traits, such as properties of aggression, have been demonstrated in a meta-analytic review of predicting various antisocial behaviours, as also to study the variation in aggression expressed in various social environments (O Boyle et al., 2018). All these studies have identified an interaction between the dark personality traits and aggression, and this goes to support the notion that empathy deficits, impulsivity, and enjoyment of cruelty are three major pathways that contribute to the role of the traits (Faratzi et al., 2024).

Science-based experts underline the importance of Dark Tetrad assessment in studying aggressive tendencies. Dark personality traits, consisting of a complete lack of empathy along with impulsive behaviours, have a major impact on aggressive behaviour, both physically and verbally. Research findings indicate that sadism is an important predictive factor of aggressive behaviour due to less empathy and being risk-takers. Research analysing how dark personality interacts to influence situational variables explains the urgency of treating empathy and impulsivity in order to minimise aggressive behaviour and social damage.

Dark Tetrad of Personality and animal abuse

Animal cruelty displays as a troubling behaviour which researchers say displays signs of antisocial tendencies across broader systems of behaviour. The connection between animal cruelty and specific personality traits that include callousness and manipulation as well as reduced empathy continues to be explored (Arluke et al., 1999). In this regard, the Dark Tetrad has received more attention as a framework for understanding why some individuals are naturally predisposed to animal cruelty (Faratzi et al., 2024). There are a few psychological theories that have been advanced to explain why people who are high in the Dark Tetrad traits may be predisposed to most of the animal cruelty (Rowlands & Canter, 2024). Notably, individuals with these traits have diminished empathy for others. Individuals who score high on sadism display an extreme inability to understand emotional states in others (Kirsch & Becker, 2007). The lack of empathy allows these individuals to see their victims as objects, rather than living beings, allowing attackers to use them without pity. Unhindered by the instinctive and natural deterrent of empathy, these individuals would be less likely to feel the guilt or remorse that, in their absence, would prevent them from acting in abusive ways (Jones & Paulhus, 2013). Specifically, sadism as a personality disorder gives people pleasure when they subject others to pain. Research data demonstrates that sadism involves enjoying the emotional response to inflicting pain on other humans and animals, with harmful acts. The characteristics of a sadistic individual override moral consideration against animal cruelty, especially when one considers that their sense of satisfaction effectively replaces any personal distress resulting from an act of cruelty (Buckels, et al., 2013). The Narcissists and Machiavellians use people as a means to an end. This leads them to exploit animals whenever these situations lead to personal gain. Impulsivity and behavioural dysfunction define the nature of psychopathy. The very nature of these characteristics limits an individual from controlling their aggressive outbursts (Blais et al., 2014). In these cases, whenever the animal appears to be weak and vulnerable, a sudden outburst of frustration can lead to impulsive and unplanned abuse. During the last decade scientific studies published in different journals documented findings, which validate these proposed mechanisms (Faratzi et al., 2024). Research explained that high scores on dark personality traits manifest in increased tendencies towards various forms of antisocial behaviour, including animal cruelty (Muris et al., 2017). Everyday sadistic tendencies lead people to self-report animal cruelty

activities, which suggest direct cruelty (O'Boyle et al., 2018).

Studying how Dark Tetrad traits link to animal mistreatment creates better opportunities for developing prevention strategies and intervention solutions. Empathy training presents an option to help people displaying dark personality traits exhibiting high sadism but complementary programs should target animal abuse prevention methods. Also, policies and awareness programs to inform the society on animal welfare would help a long way in modifying the minds of the society and decreasing the level of acceptability of an abuse (Philpotts et al., 2024). The complete prevention and intervention against animal cruelty require joint work from psychologists, animal welfare advocates, police forces and policymakers. When psychology unites with practicable legal standards and neighborhood-level intervention approaches society will start battling the underlying causes supporting animal abuse.

Some Dark Tetrad personality traits, such as manipulativeness, lack of empathy, cruelty, and sadism, can predispose people to commit cruel acts against animals. Individuals who exhibit these traits fail to experience the typical emotional barriers that stop abusive behaviour and cause them to treat victims as inanimate objects rather than living things. The optimal solution to stop animal mistreatment consists of empathetic programs to address people showing dark personality traits and population-based animal care instruction alongside professional collaborations that find abuse sources. The combination of psychological understanding and functional legal systems must be used by society to prevent and respond to animal abuse.

The current study

The contemporary phenomenon of animal cruelty has raised some social questions about its causes and consequences in a broader field of aggressive behaviour. Research activity regarding personality traits and behaviour in contemporary psychology advances through a strong theoretical development that integrates these variables. One such model is the Dark Tetrad of Personality (Paulhus, 2014).

Recent studies are increasingly establishing links that connect certain personality traits of individuals with the way in which aggression is expressed. Research shows that individuals with high Dark Tetrad scores violate social norms and live without the empathy that allows them to accept the mistreatment of humans and animals (Hartman et al., 2016; Jonason & Kroll, 2015). The correlation between young people who abuse animals and their future violence against people has confirmed that the study of animal abuse allows scientists to predict psychological disorders (Prato-Previde et al., 2022; Teachout, 2015).

The present study will study the impact of animal abuse on aggressive behaviour based on the personality traits of the Dark Tetrad. The study investigates the impact of dark personality traits on aggressive behaviours, in the case of animal abuse, and adds knowledge to the body of future research on the psychology of animal abusers and the implications of prevention and treatment programs. The study evaluates how personality traits influence behavioural patterns through review of numerous research papers to support upcoming research about educational and rehabilitation measures aimed at vulnerable groups.

The research cases are defined as, (i) Higher levels of abusive behaviour towards animals will predict higher levels in Physical Aggression, (ii) Higher levels of abusive behaviour towards animals will predict higher levels in Verbal Aggression, (iii) Higher levels of abusive behaviour towards animals will predict higher levels in Anger, (iv) Higher levels of abusive behaviour towards animals will predict higher levels in Hostility, (v) Higher levels of abusive behaviour towards animals will predict higher levels in Physical Aggression, depending on Machiavellianism,

Psychopathy, Narcissism and Sadism. As such, it is expected that in Sadism the effect of animal abuse will be higher than in Machiavellianism, Psychopathy and Narcissism. Also, it is expected that in Narcissism the effect of animal abuse will be lower than in Machiavellianism, Psychopathy and Sadism, (vi) Higher levels of abusive behaviour towards animals will predict higher levels in Verbal Aggression, depending on Machiavellianism, Psychopathy, Narcissism and Sadism. As such, it is expected that in Sadism the effect of animal abuse will be higher than in Machiavellianism, Psychopathy and Narcissism. Also, it is expected that in Narcissism the effect of animal abuse will be lower than in Machiavellianism, Psychopathy and Sadism, (vii) Higher levels of abusive behaviour towards animals will predict higher levels in Anger, depending on Machiavellianism, Psychopathy, Narcissism and Sadism. As such, it is expected that in Sadism the effect of animal abuse will be higher than in Machiavellianism, Psychopathy and Narcissism. Also, it is expected that in Narcissism the effect of animal abuse will be lower than in Machiavellianism, Psychopathy and Sadism, and (viii) Higher levels of abusive behaviour towards animals will predict higher levels in Hostility, depending on Machiavellianism, Psychopathy, Narcissism and Sadism. As such, it is expected that in Sadism the effect of animal abuse will be higher than in Machiavellianism, Psychopathy and Narcissism. Also, it is expected that in Narcissism the effect of animal abuse will be lower than in Machiavellianism, Psychopathy and Sadism."

MATERIALS & METHODS

Design

This research uses a correlational study. The independent variable of the research was animal abuse, the dependent variable was aggression behaviours (Physical aggression, Verbal aggression, Hostility, Anger) and the moderator variable was the Dark Tetrad personalities (Machiavellianism, Narcissism, Psychopathy, Sadism). All research variables are categorical. Animal abuse is an ordinal variable, with five measurement levels. Physical aggression, Verbal aggression, Hostility and Anger are ordinal variables, with five measurement levels. Machiavellianism, Psychopathy, Narcissism and Sadism are ordinal variables, with five measurement levels.

Participants

The survey used simple random sampling and snowball sampling: A total of 200 participants took part in the research, of which 102 (51%) were men and 98 (49%) were women. The participants were between 18 and 35 years old. The mean age is 25.99 and the standard deviation of age is 5.60. All participants were born and reside in Greece. People suffering from mental disorders and people who have suffered mental or physical abuse were excluded from the research.

Materials

During the research, demographic questions (gender and age) and three questionnaires measuring the research variables were carried out. For animal abuse, the P.E.T. scale (Baldry, 2004) was used, for aggression the BPAQ scale (Buss & Perry, 1992) and for the Dark Tetrad of Personality the SD4 (Paulhus et al., 2020).

P.E.T. scale. The P.E.T is a 9-item scale that assesses animal cruelty. Responses are made on a 5-point Likert scale (1 = never, 2 = hardly ever, 3 = sometimes, 4 = often, 5 = very often). The mean scores on the scale measure the participant's animal cruelty, with 1 indicating complete absence of animal cruelty and 5 indicating complete presence of animal cruelty.

BPAQ scale. The BPAQ is a questionnaire that measures the various aspects of aggression, physical aggression, verbal aggression, hostility and anger. It consists of 29 items, of which questions 1-9 measure levels of physical aggression, questions 10-14 measure levels of verbal aggression,

questions 15-21 measure levels of anger and questions 22-29 measure levels of hostility. The mean score of each subscale measures the levels of the corresponding type of aggression (Physical Aggression, Verbal Aggression, Anger, Hostility) in each participant. Responses are collected via a 5-point Likert scale (1 = extremely uncharacteristic, 2 = somewhat uncharacteristic, 3 = neither uncharacteristic nor characteristic, 4 = somewhat characteristic, 5 = extremely characteristic).

SD4 questionnaire. The SD4 is a widely used 28-item scale that measures the Dark Tetrad personality traits (Machiavellianism, Narcissism, Psychopathy, and Sadism). Responses are collected on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). The scale is divided into 4 subscales, 1 for each personality trait. The first 7 questions called "Crafty" measure levels of Machiavellianism. The second 7 questions called "Special" measure levels of Narcissism. The third 7 questions called "Wild" measure levels of Psychopathy. The fourth 7 questions called "Mean" measure levels of Sadism. The mean score measures the levels of presence of the corresponding personality trait for each participant, with 1 being the complete absence of the specific personality trait and 5 being the complete presence of the specific personality trait.

PROCEDURE

Participants were informed about the study through a public invitation on social media. Existing participants then invited their acquaintances and friends to participate. Data collection took place from 20/12/2024 to 15/02/2025. The survey was conducted online via the Google Forms platform. The average participation time for each participant was 20 minutes. The survey process began with an information session for the participants on the research topic and the procedure to be followed. Then, the participants gave their consent to participate in the survey and recorded a personal participation code, with the aim of preserving their anonymity. Subsequently, the participants completed some basic demographic information. The first questionnaire that the participants completed was the PET scale, then they completed the BPAQ scale and finally they completed the SD4.questionnaire. Upon completion of the questionnaires, participants received the debriefing sheet, were informed about the process for withdrawing their data in case they changed their mind and were sent a written thank-you message for their participation.

Ethical Considerations

During the conduct of the research, all ethical standards were observed to ensure the well-being of the participants, the integrity of the research process and the validity of the results. Ethical approval was obtained from the appropriate University of Derby Ethics Committee at Mediterranean College in Athens, Greece, prior to the conduct of the research, with the submission of a detailed research proposal. Before giving their consent, the participants were informed about the purpose of the study, the procedures, the risks, the benefits, the assurance of confidentiality, the right to withdraw, the contact details of the researcher and the voluntary nature of participation, through a consent form. Upon completion of the research process, the participants were given a debriefing sheet, with the objectives of the study, for what purpose the data would be used and the importance of their contribution. Finally, the research meets all the guidelines set out in the Code of Ethics and Conduct of the British Psychological Society (BPS).

STATISTICAL ANALYSIS

Using G*Power version 3.1.9.6, a priori power analysis was performed (Faul et al., 2007) to determining sample size. The minimal sample size required for multiple regression analysis with this effect size is N = 138, with a significance criterion of = .05 and power = .95. Therefore, the N = 200 obtained sample size is more than sufficient

to test the study's hypothesis. Data analysis was performed using the program IBM SPSS Statistics 28. After the internal reliability of the scales was checked, skewness and kurtosis of the variables were checked. Then, tests were carried out to investigate homoscedasticity, linearity and normality, calculations of z-scores, Q-Q plots, P-P plots and boxplots.

Pearson's correlation analyses were then conducted to test the relationship between animal abuse and types of aggression, between animal abuse and Dark Tetrad personalities, and between Dark Tetrad personalities and types of aggression. After first producing a scatterplot with a regression line for the predictor variable with each outcome variable, four simple linear regressions were conducted with predictor variable animal abuse and outcome variables types of aggression, to test the changes caused by animal abuse scores in the scores of types of aggression.

Finally, moderation analyses were performed through the Process macro extension (Hayes, 2013), with animal cruelty as the independent variable, aggression types as dependent variables, and Dark Tetrad personalities as moderator variables. The purpose of this analysis is to observe the indirect effect of Dark Tetrad personalities on the relationship between animal cruelty and aggression types. In addition, the effect size (R^2) was presented based on Cohen (1988), which is appropriate for estimating the effect size in a simple linear regression model. Small, medium, and large, or 0.01–0.05, 0.06-0.14, and >0.15, respectively, are the effect size estimates for R^2 (Cohen, 2013).

RESULT

Data screening

Initial checks showed the distribution of Psychopathy and Sadism slightly convex (table 1) based on the 1.96 threshold (Cohen, 1988). 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) (Kim, 2013).

Table 1. Z scores of the study variables.

	Skewness	Kurtosis
Animal abuse	1.35	-1.58
Physical Aggression	0.79	-0.62
Verbal Aggression	0.28	-0.26
Anger	0.40	-0.54
Hostility	0.59	-0.82
Machiavellianism	0.21	-1.42
Narcissism	1.82	-1.73
Psychopathy	0.70	-2.48
Sadism	-1.74	-2.09

Table 2. Descriptive statistics of the study variables.

	Mean	SD	Minimum	Maximum
Animal abuse	2.91	0.83	1.50	4.80
Physical Aggression	3.47	0.57	2.03	4.80
Verbal Aggression	3.18	0.46	2.04	4.53
Anger	3.34	0.50	2.03	4.60
Hostility	3.57	0.53	2.39	4.90
Machiavellianism	3.10	0.61	1.90	4.50
Narcissism	2.92	0.65	1.80	4.40
Psychopathy	3.31	0.77	2.00	4.80
Sadism	3.58	0.76	2.10	5.00

The checks showed that the assumptions of normal distribution, homoscedasticity and linearity are met. No missing values were presented. An outlier (49) was identified

within the Verbal Aggression data set via the boxplot, but its Z-score was well within the acceptable range (<±1.96), indicating that it is not statistically an outlier. Comparative analysis with and without this observation revealed negligible differences in the results. Thus, the outlier was retained in the analysis.

Reliability for scales

The subscales of the BPAQ scale appeared to have good internal reliability through Cronbach's Alpha: Physical Aggression (a = 0.83), Verbal Aggression (a = 0.71), Anger (a = 0.79), Hostility (a = 0.78). The subscales of the Short Dark Tetrad scale appeared to have good internal reliability through Cronbach's Alpha: Machiavellianism (a = 0.80), Psychopathy (a = 0.82), Narcissism (a = 0.83), Sadism (a = 0.83). The Physical and Emotional Tormenting animals scale shows good internal reliability through Cronbach's Alpha (a = 0.84). No items on any scale had to be removed.

Correlation analysis

Based on the results of Pearson‘s Correlation test (Table 3) there was a strong positive statistical correlation between Physical Aggression and animal abuse (r = 0.807, df = 200, p < .001), a strong positive statistical correlation between Verbal Aggression and animal abuse (r = 0.787, df = 200, p < .001), a strong positive statistical correlation between Anger and animal abuse (r = 0.770, df = 200, p < .001), a strong positive statistical correlation between Hostility and animal abuse (r = 0.813, df = 200, p < .001). There was a positive statistical correlation between Narcissism and Verbal Aggression (r = 0.157, df = 200, p = .026). There were no statistical correlations in the remaining Pearson’s correlation analyses conducted (Table 3).

Table 3. Correlation coefficients (and significance levels) for the predictors and outcome variable.

Variable	1	2	3	4	5	6	7	8
1. Animal abuse								
2. Physical Aggression	.807***							
3. Verbal Aggression	.787***	.641***						
4. Anger	.770***	.607***	.611***					
5. Hostility	.813***	.659***	.614***	.581***		-.001		
6. Machiavellianism	-.054	-.106	-.023	-.074	-.090			
7. Narcissism	.091	.068	.157*	.047	.114	-.131	.075	
8. Psychopathy	-.032	-.005	.045	.049	.014		-.060	-.035
9. Sadism	.018	.049	.058	-.057	.075	.090		

*** p < .05, ** p < .01, *** p < .001**

Simple linear regression analysis

The data were analyzed using four simple linear regressions, using the enter method (Table 4).

The first regression equation produced a large effect size (R^2 = 0.652), indicating that animal abuse was a significant predictor of levels of Physical Aggression, F (1, 198) = 370.492, p < .001. There was a significant positive relationship between animal abuse and Physical Aggression, t = 19.248, df = 199, p < .001. The model predicts that a one-unit increase in animal abuse would correspond to a 0.559-unit increase in levels of Physical Aggression.

The second regression equation produced a large effect size (R^2 = 0.619), indicating that animal abuse was a significant predictor of levels of Verbal Aggression, F (1, 198) = 321.894, p < .001. There was a significant positive relationship between animal abuse and Verbal Aggression, t = 25.602, df = 199, p < .001. The model predicts that a one-unit increase in animal abuse would correspond to a 0.440-unit increase in levels of Verbal Aggression.

The third regression equation produced a large effect size (R^2 = 0.592), indicating that animal abuse was a significant predictor of levels of Anger, F(1, 198) = 287.855, p <

.001. There was a significant positive relationship between animal abuse and Anger, t = 24.035, df = 199, p < .001. The model predicts that a one-unit increase in animal abuse would correspond to a 0.463-unit increase in levels of Anger.

The fourth regression equation produced a large effect size (R^2 = 0.661), indicating that animal abuse was a significant predictor of levels of Hostility, $F(1, 198) = 385.668$, p < .001. There was a significant positive relationship between animal abuse and Hostility, t = 25.724, df = 199, p < .001. The model predicts that a one-unit increase in animal abuse would correspond to a 0.519-unit increase in levels of Hostility.

Table 4. Simple Linear Regression Results Predicting Physical Aggression, Verbal Aggression, Anger, and Hostility from Animal Abuse.

Dependent Variables	Predictor	B	SE	t	p	R^2
Physical Aggression	Animal Abuse	.559***	.029	19.248	p < .001	.652
Verbal Aggression	Animal Abuse	.440***	. 024	17.941	p < .001	.619
Anger	Animal Abuse	.463***	.027	16.966	p < .001	.592
Hostility	Animal Abuse	.519***	.026	19.638	p < .001	.661

*** p < .05, ** p < .01, *** p < .001**

Moderation analysis

To investigate each dependent variable with each dark tetrad personality as moderator variable, sixteen simple moderation analyses were performed using Process.

In the initial four moderation analyses the outcome variable was Physical Aggression. The predictor variable for the analyses was Animal Abuse. In the first moderation analysis (table 5) the moderator variable evaluated for the analysis was Machiavellianism. In this case the interaction is non-significant, b = 0.00, 95% CI [--0.09, 0.10], t = 0.07, p = .94. In the second moderation analysis (table 6) the moderator variable evaluated for the analysis was Narcissism. In this case the interaction is non-significant, b = -0.06, 95% CI [--0.15, 0.27], t = -1.39, p = .16. Aggression is not moderated by Narcissism. In the third moderation analysis (table 7) the moderator variable evaluated for the analysis was Psychopathy. In this case the interaction is non-significant, b = 0.03, 95% CI [--0.04, 0.11], t = 0.85, p = .39. In the fourth moderation analysis (table 8) the moderator variable evaluated for the analysis was Sadism. In this case the interaction is non-significant, b = 0.001, 95% CI [--0.08, 0.08], t = 0.03, p = .97. The results indicate that Machiavellianism, Narcissism, Psychopathy, and Sadism do not moderate the relationship between animal abuse and physical aggression.

Table 5. Results of Moderation analysis between animal abuse and Physical Aggression, by Machiavellianism.

	b	se	t	p
Constant	2.06 (1.17, 2.95)	0.45	4.58	p < .001
Machiavellianism	-0.06 (-0.34, 0.20)	0.14	-0.48	p = .62
Animal Abuse	0.54 (0.23, 0.85)	0.15	3.50	p = .001
Machiavellianism x Animal Abuse	0.004 (-0.09, 0.10)	0.04	0.07	p = .94

Note. R^2 = .65.

Table 6. Results of Moderation analysis between animal abuse and Physical Aggression, by Narcissism.

	b	se	t	p
Constant	1.30 (0.47, 2.13)	0.42	3.08	p = .002
Narcissism	0.18 (-0.09, 0.46)	0.14	1.30	p = .19
Animal Abuse	0.74 (0.47, 1.01)	0.13	5.46	p < .001
Narcissism x Animal Abuse	-0.06 (-0.15, 0.02)	0.04	-1.39	p = .16

Note. R^2 = .65.

Table 7. Results of Moderation analysis between animal abuse and Physical Aggression, by Psychopathy.

	b	se	t	p
Constant	2.10 (1.33, 2.87)	0.39	5.35	$p < .001$
Psychopathy	-0.08 (-0.09, 0.46)	0.11	-0.68	$p = .49$
Animal Abuse	0.44 (0.18, 0.71)	0.13	3.37	$p = .001$
Psychopathy x Animal Abuse	0.03 (-0.04, 0.11)	0.04	0.85	$p = .39$

Note. $R^2 = .65$.

Table 8. Results of Moderation analysis between animal abuse and Physical Aggression, by Sadism.

	b	se	t	p
Constant	1.76 (0.84, 2.69)	0.46	3.78	$p < .001$
Sadism	0.02 (-0.23, 0.27)	0.12	0.17	$p = .86$
Animal Abuse	0.55 (0.25, 0.85)	0.15	3.64	$p < .001$
Sadism x Animal Abuse	0.001 (-0.08, 0.08)	0.04	0.03	$p = .97$

Note. $R^2 = .65$.

The graphs below confirm the results from the simple slope analyses between animal abuse and Physical Aggression, indicating that the relationship between animal abuse and physical aggression does not significantly differ at different levels of Machiavellianism (figure 1), Narcissism (figure 2), Psychopathy (figure 3) and Sadism (figure 4).

Figure 1. Simple slope analysis of animal abuse effects on physical aggression at various levels of Machiavellianism.

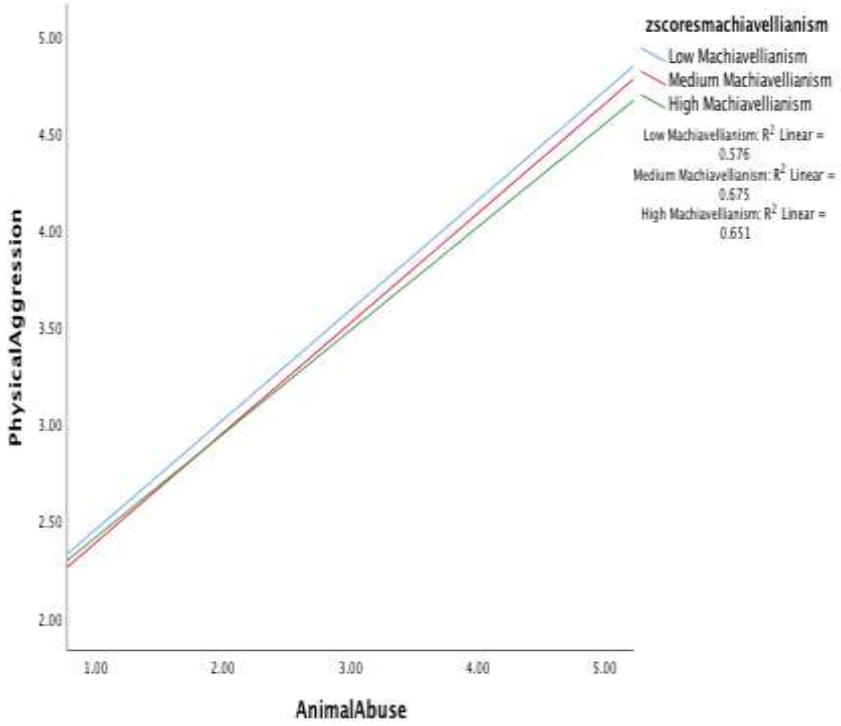


Figure 2. Simple slope analysis of animal abuse effects on physical aggression at various levels of Narcissism.

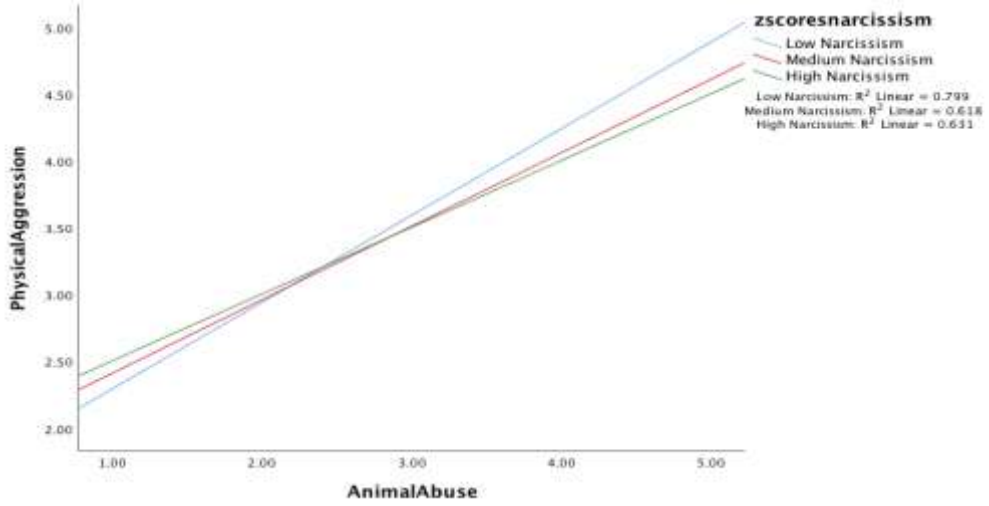


Figure 3. Simple slope analysis of animal abuse effects on physical aggression at various levels of Psychopathy.

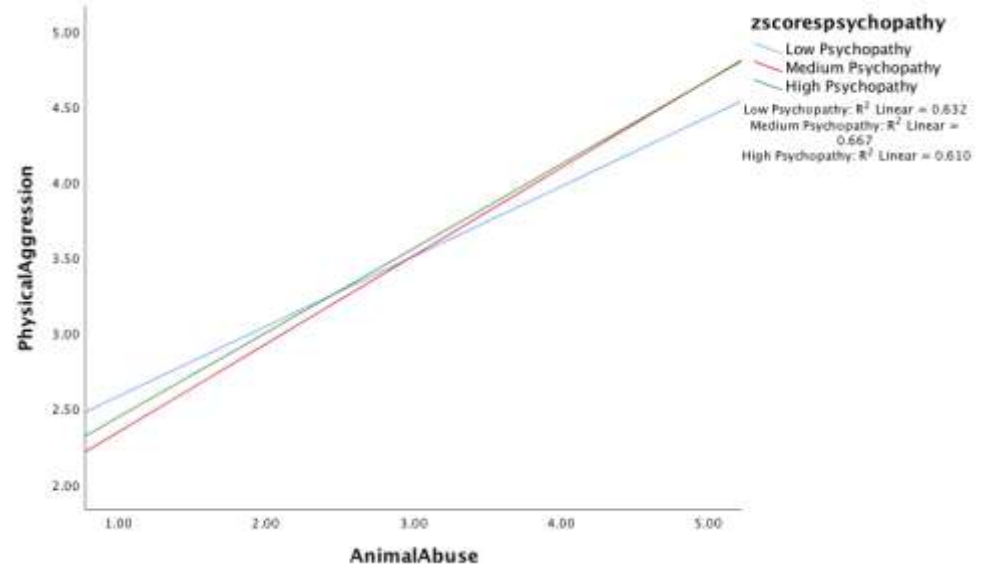
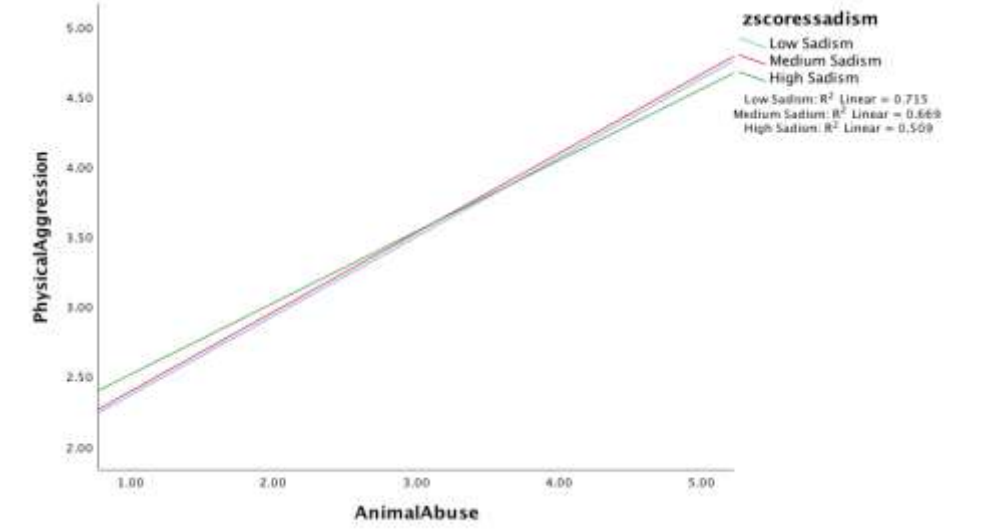


Figure 4. Simple slope analysis of animal abuse effects on physical aggression at various levels of Sadism.



In the next four moderation analyses the outcome variable was Verbal Aggression. The predictor variable for the analyses was Animal Abuse. In the fifth moderation analysis (table 9) the moderator variable evaluated for the analysis was Machiavellianism. In this case the interaction is non-significant, b = 0.008, 95% *CI* [--0.07, 0.09], t = 0.20, p = .84. In the sixth moderation analysis (table 10) the moderator variable evaluated for the analysis was Narcissism. In this case the interaction is non-significant, b = -0.01, 95% *CI* [--0.08, 0.06], t = -0.31, p = .75. In the seventh moderation analysis (table 11) the moderator variable evaluated for the analysis was Psychopathy. In this case the interaction is non-significant, b = 0.02, 95% *CI* [--0.03, 0.09], t = 0.83, p = .40. In the eighth moderation analysis (table 12) the moderator variable evaluated for the analysis was Sadism. In this case the interaction is non-significant, b = -0.05, 95% *CI* [--0.12, 0.01], t = -1.54, p = .12. The results indicate that Machiavellianism, Narcissism, Psychopathy, and Sadism do not moderate the relationship between animal abuse and verbal aggression.

Table 9. Results of Moderation analysis between animal abuse and Verbal Aggression, by Machiavellianism.

	b	se	t	p
Constant	1.92 (1.17, 2.68)	0.38	5.05	$p < .001$
Machiavellianism	-0.008 (-0.24, 0.22)	0.11	-0.06	$p = .94$
Animal Abuse	0.41 (0.15, 0.67)	0.13	3.13	$p = .002$
Machiavellianism x Animal Abuse	0.008 (-0.07, 0.09)	0.04	0.20	$p = .84$

Note. R^2 = .62.

Table 10. Results of Moderation analysis between animal abuse and Verbal Aggression, by Narcissism.

	b	se	t	p
Constant	1.63 (0.93, 2.33)	0.35	4.60	$p < .001$
Narcissism	0.09 (-0.13, 0.33)	0.12	0.81	$p = .41$
Animal Abuse	0.47 (0.24, 0.69)	0.11	4.11	$p < .001$
Narcissism x Animal Abuse	-0.01 (-0.88, 0.63)	0.03	-0.31	$p = .75$

Note. R^2 = .62.

Table 11. Results of Moderation analysis between animal abuse and Verbal Aggression, by Psychopathy.

	b	se	t	p
Constant	2.01 (1.36, 2.66)	0.32	6.12	$p < .001$
Psychopathy	-0.03 (-0.23, 0.15)	0.09	-0.37	$p = .71$
Animal Abuse	0.35 (0.18, 0.71)	0.11	3.14	$p = .002$
Psychopathy x Animal Abuse	0.02 (-0.03, 0.09)	0.03	0.83	$p = .40$

Note. R^2 = .62.

Table 12. Results of Moderation analysis between animal abuse and Verbal Aggression, by Sadism.

	b	se	t	p
Constant	1.23 (0.46, 2.00)	0.39	3.14	$p = .002$
Sadism	0.18 (-0.02, 0.39)	0.10	1.74	$p = .08$
Animal Abuse	0.63 (0.38, 0.88)	0.12	4.96	$p < .001$
Sadism x Animal Abuse	-0.05 (-0.12, 0.01)	0.03	-1.54	$p = .12$

Note. R^2 = .62.

The graphs bellow confirms the results from the simple slope analyses between animal abuse and Verbal Aggression, indicating that the relationship between animal abuse

and verbal aggression does not significantly differ at different levels of Machiavellianism (figure 5), Narcissism (figure 6), Psychopathy (figure 7) and Sadism (figure 8).

Figure 5. Simple slope analysis of animal abuse effects on verbal aggression at various levels of Machiavellianism.

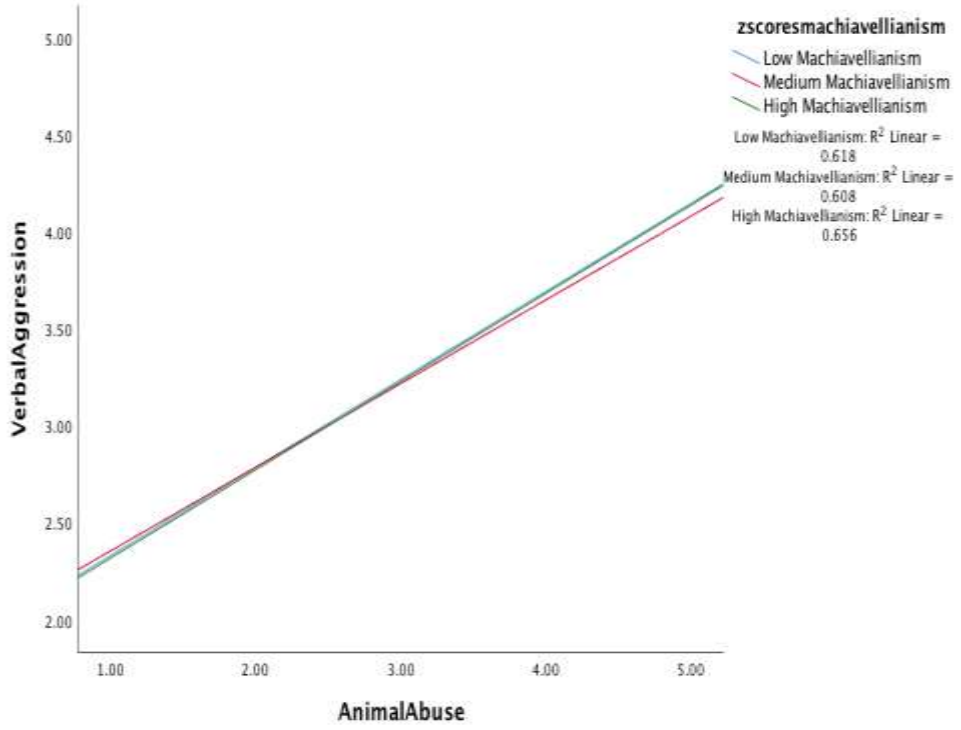


Figure 6. Simple slope analysis of animal abuse effects on verbal aggression at various levels of Narcissism.

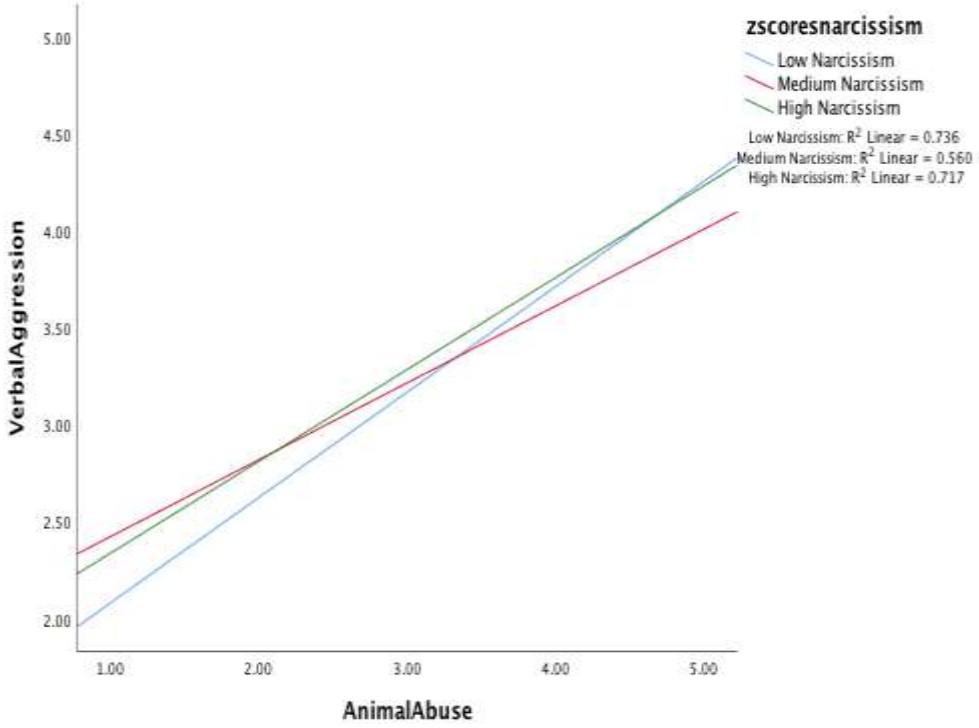


Figure 7. Simple slope analysis of animal abuse effects on verbal aggression at various levels of Psychopathy.

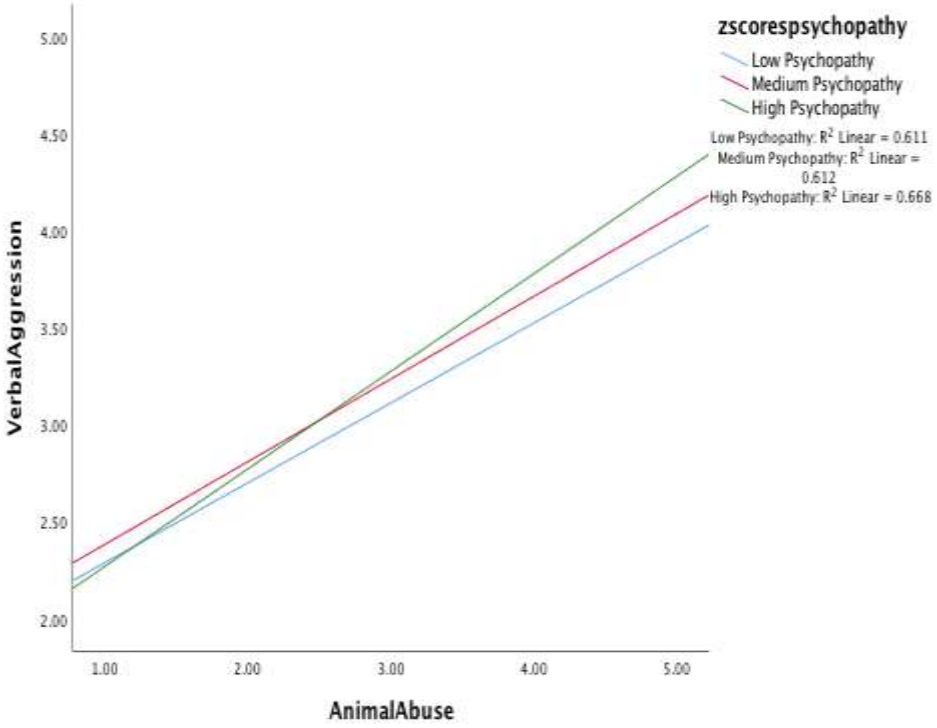
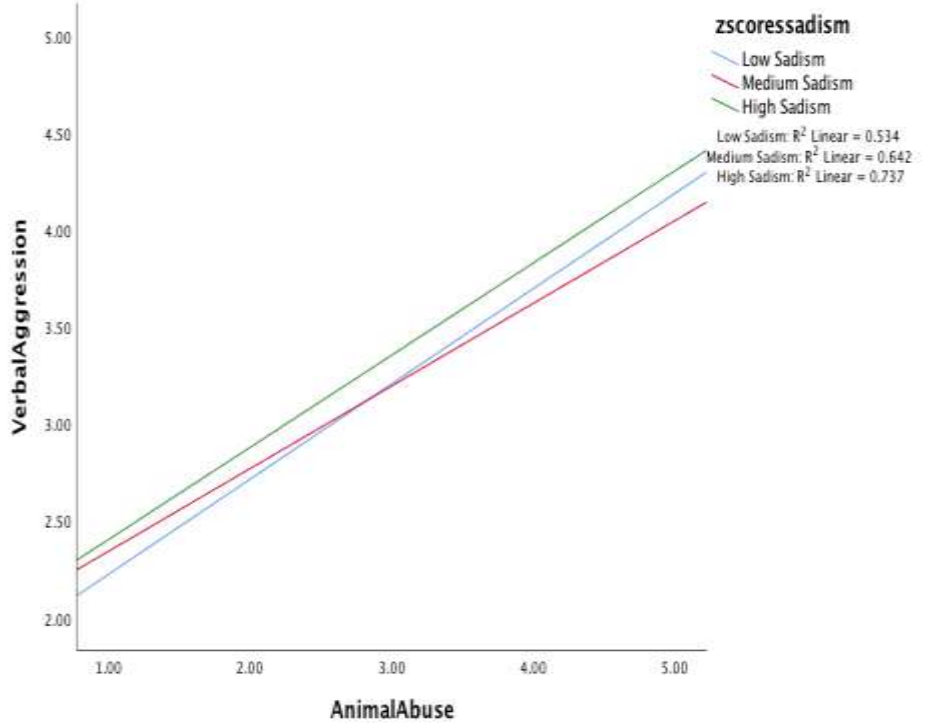


Figure 8. Simple slope analysis of animal abuse effects on verbal aggression at various levels of Sadism.



In the following four moderation analyses the outcome variable was Anger. The predictor variable for the analyses was Animal Abuse. In the ninth moderation analysis (table 13) the moderator variable evaluated for the analysis was Machiavellianism. In this case the interaction is non-significant, b = -0.003, 95% *CI* [--0.09, 0.08], t = -0.07, p = .94. In the tenth moderation analysis (table 14) the

moderator variable evaluated for the analysis was Narcissism. In this case the interaction is non-significant, b = 0.05, 95% *CI* [--0.03, 0.13], t = 1.18, p = .23. In the eleventh moderation analysis (table 15) the moderator variable evaluated for the analysis was Psychopathy. In this case the interaction is non-significant, b = 0.03, 95% *CI* [--0.04, 0.10], t = 0.91, p = .36. In the twelfth moderation analysis (table 16) the moderator variable evaluated for the analysis was Sadism. In this case the interaction is non-significant, b = -0.04, 95% *CI* [--0.12, 0.03], t = -1.16, p = .24. The results indicate that Machiavellianism, Narcissism, Psychopathy, and Sadism do not moderate the relationship between animal abuse and anger.

Table 13. Results of Moderation analysis between animal abuse and Anger, by Machiavellianism.

	b	se	t	p
Constant	2.04 (1.21, 2.88)	0.42	4.82	$p < .001$
Machiavellianism	-0.01 (-0.27, 0.24)	0.13	-0.13	$p = .89$
Animal Abuse	0.47 (0.18, 0.76)	0.14	3.21	$p = .002$
Machiavellianism x Animal Abuse	-0.003 (-0.09, 0.08)	0.04	0.07	$p = .94$

Note. R^2 = .59.

Table 14. Results of Moderation analysis between animal abuse and Anger, by Narcissism.

	b	se	t	p
Constant	2.48 (1.70, 3.27)	0.39	6.26	$p < .001$
Narcissism	-0.17 (-0.43, 0.09)	0.13	-1.28	$p = .20$
Animal Abuse	0.31 (0.06, 0.56)	0.12	2.46	$p = .01$
Narcissism x Animal Abuse	0.05 (-0.03, 0.13)	0.04	1.18	$p = .23$

Note. R^2 = .59.

Table 15. Results of Moderation analysis between animal abuse and Anger, by Psychopathy.

	b	se	t	p
Constant	2.14 (1.42, 2.86)	0.36	5.84	$p < .001$
Psychopathy	-0.04 (-0.26, 0.16)	0.11	-0.44	$p = .65$
Animal Abuse	0.35 (0.10, 0.59)	0.12	2.84	$p = .005$
Psychopathy x Animal Abuse	0.03 (-0.04, 0.10)	0.03	0.91	$p = .36$

Note. R^2 = .60.

Table 16. Results of Moderation analysis between animal abuse and Anger, by Sadism.

	b	se	t	p
Constant	1.67 (0.81, 2.53)	0.43	3.84	$p < .001$
Sadism	0.08 (-0.14, 0.32)	0.11	1.73	$p = .46$
Animal Abuse	0.62 (0.34, 0.90)	0.14	4.41	$p < .001$
Sadism x Animal Abuse	-0.04 (-0.12, 0.03)	0.03	-1.16	$p = .26$

Note. R^2 = .60.

The graphs bellow confirms the results from the simple slope analyses between animal abuse and Anger, indicating that the relationship between animal abuse and Anger does not significantly differ at different levels of Machiavellianism (figure 9), Narcissism (figure 10), Psychopathy (figure 11) and Sadism (figure 12).

Figure 9. Simple slope analysis of animal abuse effects on anger at various levels of Machiavellianism.

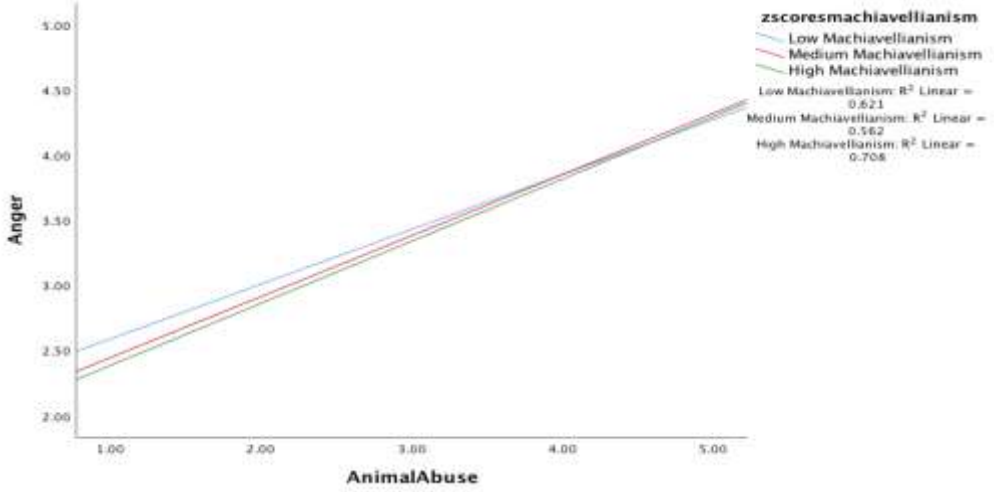


Figure 10. Simple slope analysis of animal abuse effects on anger at various levels of Narcissism.

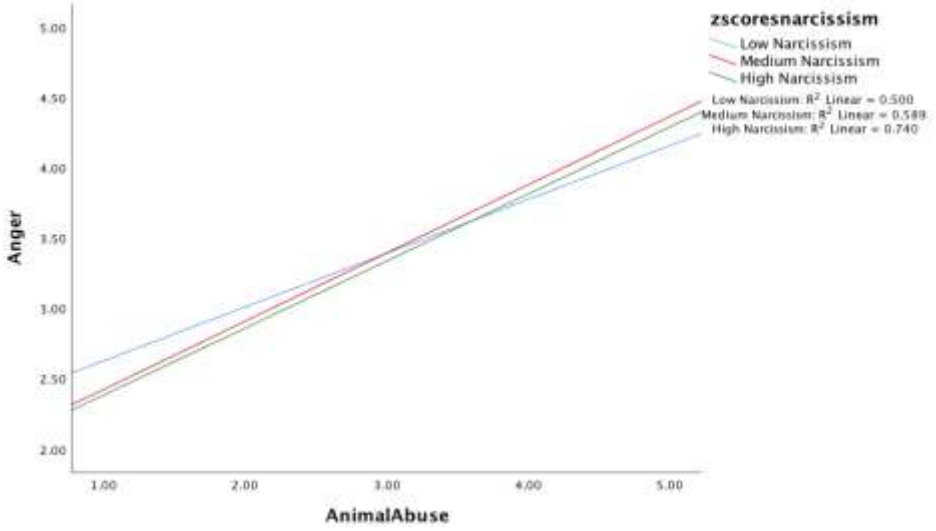


Figure 11. Simple slope analysis of animal abuse effects on anger at various levels of Psychopathy.

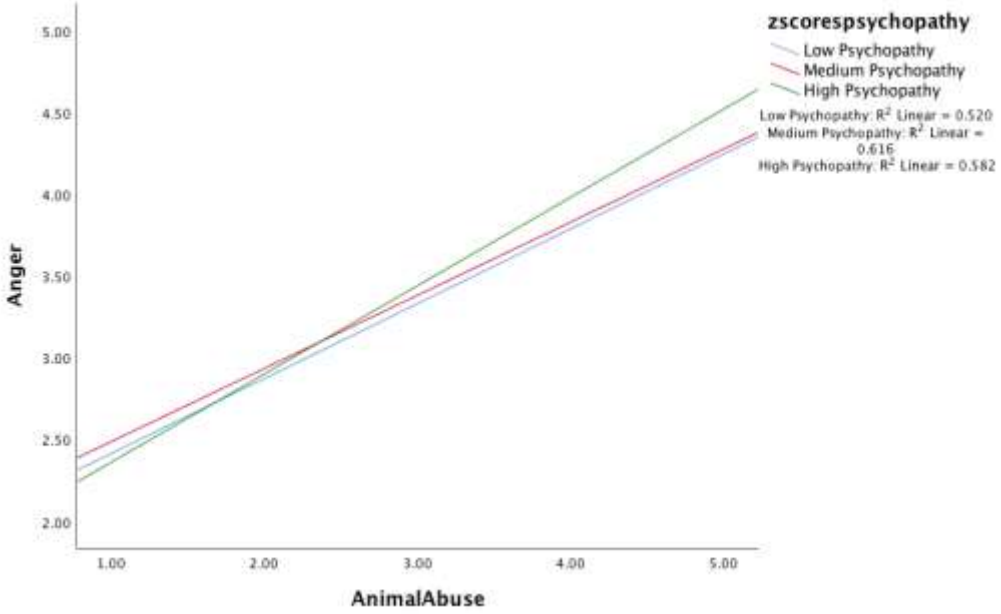
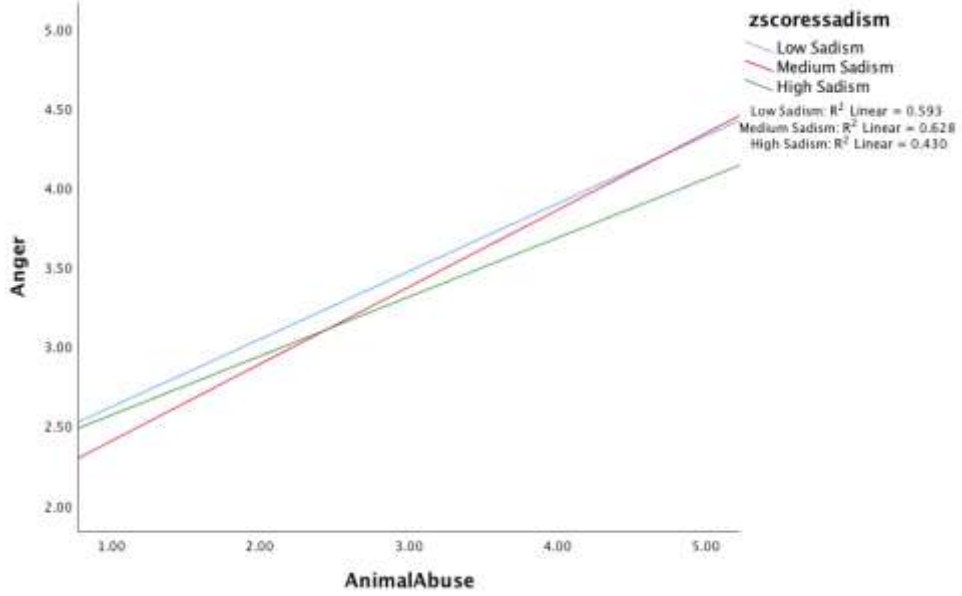


Figure 12. Simple slope analysis of animal abuse effects on anger at various levels of Sadism.



In the last four moderation analyses the outcome variable was Hostility. The predictor variable for the analyses was Animal Abuse. In the thirteenth moderation analysis (table 17) the moderator variable evaluated for the analysis was Machiavellianism. In this case the interaction is non-significant, b = 0.01, 95% *CI* [--0.07, 0.10], t = 0.33, p = .73. In the fourteenth moderation analysis (table 18) the moderator variable evaluated for the analysis was Psychopathy. In this case the interaction is non-significant, b =- 0.02, 95% *CI* [--0.09, 0.05], t = -0.56, p = .57. In the fifteenth moderation analysis (table 19) the moderator variable evaluated for the analysis was Sadism. In this case the interaction is non-significant, b = -0.03, 95% *CI* [--0.11, 0.03], t = -1.05, p = .29. The results indicate that Machiavellianism, Psychopathy, and Sadism do not moderate the relationship between animal abuse and hostility. In the sixteenth moderation analysis (table 20) the moderator variable evaluated for the analysis was Narcissism. In this case the interaction is statistically significant., b = 0.10, 95% *CI* [0.02, 0.18], t = 2.53, p = .01, indicating that there is a significant positive effect of animal abuse on hostility, and this relationship seems to be influenced by the individual's levels of narcissism.

Table 17. Results of Moderation analysis between animal abuse and Hostility, by Machiavellianism.

	b	se	t	p
Constant	2.32 (1.51, 3.12)	0.41	5.65	$p < .001$
Machiavellianism	-0.08 (-0.33, 0.17)	0.12	-0.63	$p = .52$
Animal Abuse	0.47 (0.19, 0.75)	0.14	3.31	$p = .001$
Machiavellianism x Animal Abuse	0.01 (-0.07, 0.10)	0.04	0.33	$p = .73$

Note. R^2 = .66.

Table 18. Results of Moderation analysis between animal abuse and Hostility, by Psychopathy.

	b	se	t	p
Constant	1.77 (1.07, 2.48)	0.35	4.98	$p < .001$
Psychopathy	0.08 (-0.12, 0.29)	0.10	0.80	$p = .42$
Animal Abuse	0.58 (0.34, 0.82)	0.12	4.85	$p < .001$
Psychopathy x Animal Abuse	-0.02 (-0.09, 0.05)	0.03	-0.56	$p = .57$

Note. R^2 = .66.

Table 19. Results of Moderation analysis between animal abuse and Hostility, by Sadism.

	b	se	t	p
Constant	1.49 (0.65, 2.32)	0.42	3.53	$p = .001$
Sadism	0.16 (-0.06, 0.38)	0.11	1.38	$p = .16$
Animal Abuse	0.65 (0.38, 0.93)	0.13	4.80	$p < .001$
Sadism x Animal Abuse	-0.03 (-0.11, 0.03)	0.03	-1.05	$p = .29$

Note. $R^2 = .66$.

Table 20. Results of Moderation analysis between animal abuse and Hostility, by Narcissism.

	b	se	t	p
Constant	2.88 (2.13, 3.62)	0.37	7.61	$p < .001$
Narcissism	-0.28 (-0.53, 0.02)	0.12	-2.19	$p = .02$
Animal Abuse	0.21 (-0.02, 0.45)	0.12	1.74	$p = .08$
Narcissism x Animal Abuse	0.10 (0.02, 0.18)	0.04	2.53	$p = .01$

Note. $R^2 = .67$.

The graphs bellow confirms the results from the simple slope analyses between animal abuse and Hostility, indicating that the relationship between animal abuse and Hostility does not significantly differ at different levels of Machiavellianism (figure 13), Psychopathy (figure 14) and Sadism (figure 15).

Figure 13. Simple slope analysis of animal abuse effects on hostility at various levels of Machiavellianism.

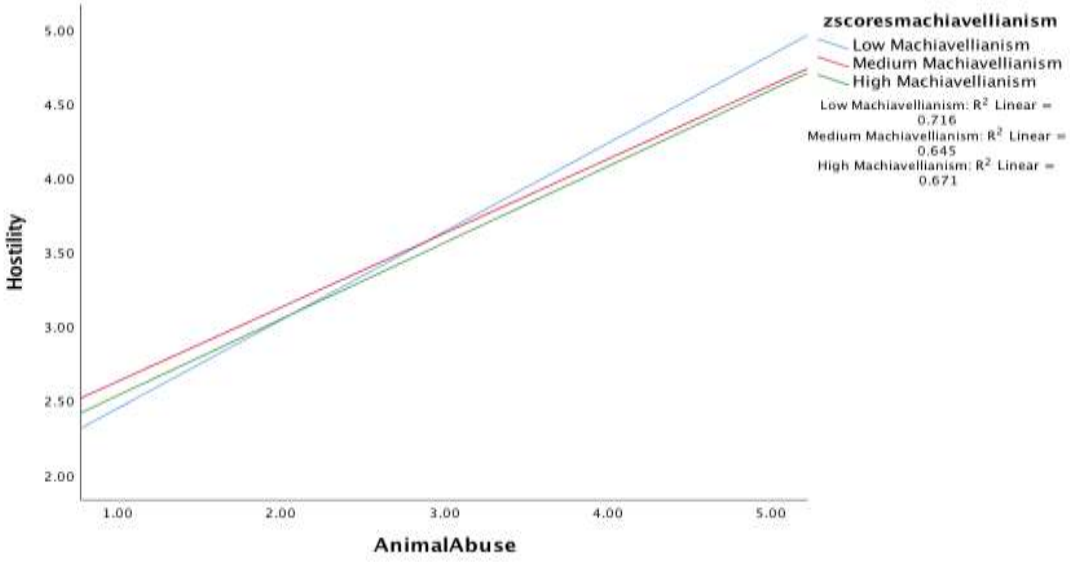


Figure 14. Simple slope analysis of animal abuse effects on hostility at various levels of Psychopathy.

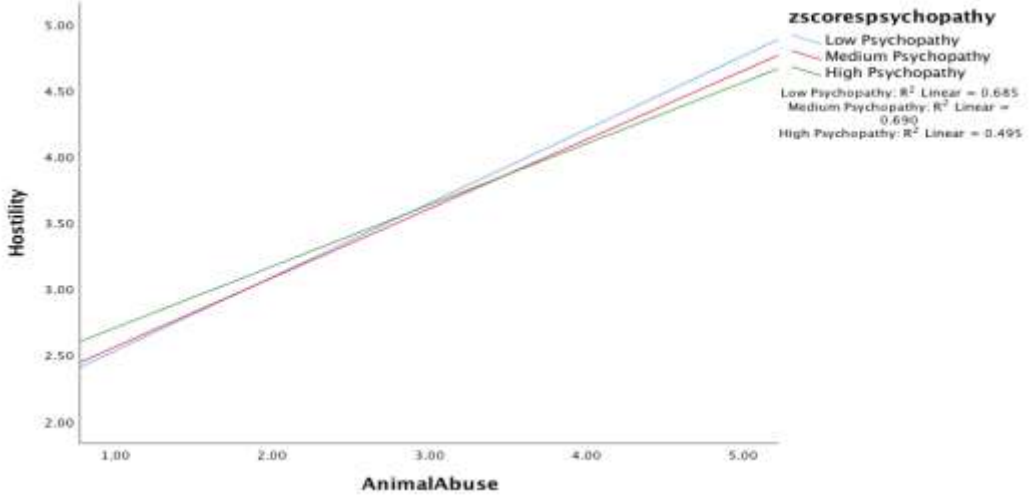
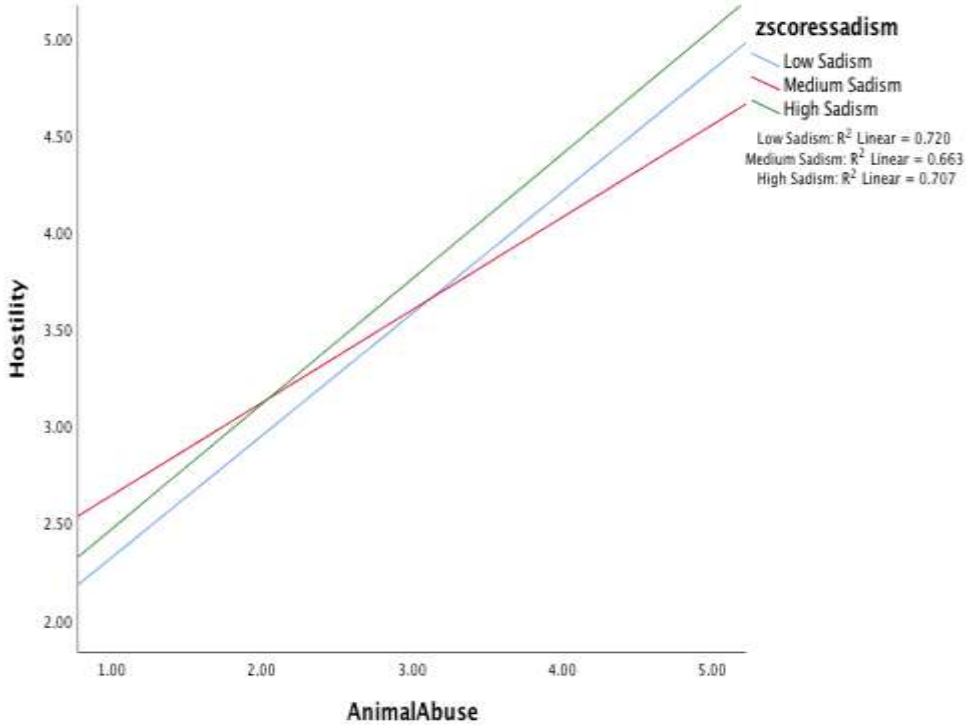
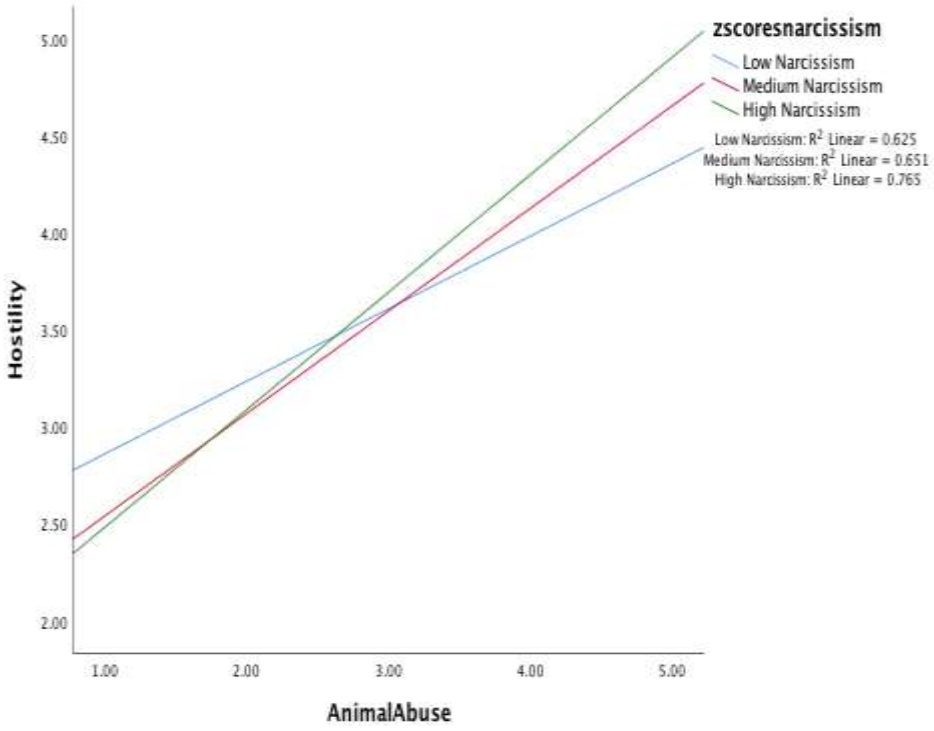


Figure 15. Simple slope analysis of animal abuse effects on hostility at various levels of Sadism.



The graph below confirms the result from the simple slope analysis between animal abuse and hostility, indicating that the relationship between animal abuse and hostility differs significantly across different levels of Narcissism (Figure 16). This suggests that narcissistic traits enhance the positive relationship between animal abuse and hostility. At low levels of Narcissism, the effect of animal abuse on hostility is modest, but becomes more substantial at medium and high levels.

Figure 16. Simple slope analysis of animal abuse effects on hostility at various levels of Narcissism.



DISCUSSION

The present study aimed to examine the relationship between animal abuse and forms of aggression. Specifically, animal abuse was investigated as a predictive factor for physical aggression, verbal aggression, anger and hostility. Statistical results demonstrate strong connections mainly between animal abuse incidents and all forms of aggression. Based on regression analysis animal abuse explained between 59.2% to 66.1% of the aggressive conduct variance. Thus, the first four research hypotheses (H_1, H_2, H_3, H_4), which propose a significant relationship between animal abuse and various forms of aggression, assuming that higher levels of animal abuse would be associated with increased physical aggression, verbal aggression, anger, and hostility, are accepted by the research results. The research findings confirmed the first four research hypotheses, because they revealed significant positive relationships between animal abuse and physical aggression (r = 0.807), verbal aggression (r = 0.787), anger (r = 0.770), and hostility (r = 0.813) in effect sizes, demonstrating predictive validity. Furthermore, the research measured how the Dark Tetrad Personality traits affected the relationship between animal abuse and different forms of aggression, including physical aggression, verbal aggression, anger and hostility. The research hypotheses H_5, H_6, H_7, H_8 assuming moderating effects of Machiavellianism, Psychopathy, Narcissism and Sadism received empirical support only in the context of narcissism moderating hostility. The moderation analyses demonstrated that Narcissism acted as a significant factor in altering the connection between animal abuse and aggressiveness, but the other types of Dark Tetrad Personality failed to achieve statistical significance (R^2 = 0.67), rejecting the research hypotheses H_5, H_6, H_7, H_8.

Previous studies support the findings of the present study that animal abuse creates strong positive links with physical and verbal aggression, while also increasing levels of anger and hostility (Ireland et al., 2019; Ascione, 2001). The results of Nurse's research (2016) match those of the present study in that the exposure to animal abuse is positively correlated with the aggression behaviour in the wider social components. Early exposure of children to animal abuse creates desensitisation to violence, which increases the likelihood of them displaying aggressive behaviours towards both animals and people (Albert, 2017; Alleyne & Parfitt, 2017). The study's findings confirm the prediction, which demonstrates that animal abuse subjects display higher aggressive tendencies according to the General Aggression Model (GAM) framework developed by Krahé (2020). These findings are affirmative to what other psychological theories claim, that aggression is a learned behaviour through the observation of others in the society. A good example is provided by Social Learning Theory (Albert, 2017), aggressive behaviours can be learned by either imitating or observing other individuals, especially when such other people model animal abuse. People who witness or participate in animal abuse later show aggressive behaviours toward others in their personal relationships (Nurse, 2016; Teachout, 2015). Thus, early intervention in animal abuse can prevent wider aggressive behaviours. Studies also support that individuals with higher tendencies towards animal abuse are often characterised by disproportionate anger in their emotional reactions and blame others (Bonta & Andrews, 2023). Thus, experts need to understand how emotional contributions affect larger occurrences of aggression. Furthermore, hostility, as a more continuous and enduring trait, influences all aggressive tendencies and can be fuelled by acts of animal abuse (Krahé, 2020; Parkes & Signal, 2017). Thus, by identifying abusive behaviours towards animals, characteristics of hostility can also be avoided.

The findings of the study are supported by previous studies, which explain how empathy deficits created by Narcissism act

to enhance aggressive behaviour (Faratzi et al., 2024; Jones & Paulhus, 2013). High narcissistic traits lead people to display increased hostility, which demonstrates the complex nature of aggression in interpersonal relationships (Smith et al., 2021). The results of the study disagree with previous studies, which show that Psychopathy and Machiavellianism function as increased indicators of aggressive patterns along with abusive behaviour towards animals (Faratzi et al., 2024; O'Boyle et al., 2018). The mixed results emphasise a requirement for research that identifies how the behaviours respond across different environments because research methods along with sample characteristics could generate these inconsistent outcomes. The results contradicted previous findings regarding Psychopathy and Machiavellianism, with Blair (2024) discovered impulsive actions from people with psychopathy and Machiavellian traits lead to aggressive behavior (Faratzi et al., 2024). The results of the analysis from the current study suggest that the relationship between aggression and animal abuse appears to be as complex and influenced by environmental conditions as previously understood. The impulsive behaviours commonly observed in psychopathic individuals appear to target specific subjects rather than creating a comprehensive attitude toward animal abuse. The study contributes to research on Sadism, because it confirms that more Sadistic persons demonstrate more animal abuse and aggressive behaviour (Buckels et al., 2014). The data suggested unique connections, but evidence was lacking for the direct effects of Sadism leading to aggressive behaviour, because moral disengagement processes remain inactive, supporting previous studies (Blair, 2018). It has been observed that individuals who display high levels of Sadism may exhibit self-control over their aggressive behaviours at certain times, despite enjoying abusive situations (Blair, 2018). Therefore, this may be the reason for the lack of statistical significance in the analysis of Sadism moderation.

Limitations and recommendations for future studies

Despite offering important conclusions the research does have certain restrictions, which need acknowledgment. Self-reported data collection brings potential accuracy problems due to biases, which affect the quality of information. People might report less socially unacceptable behaviours such as animal cruelty and aggressive conduct because they wish to appear favourable. The utilised standardised scales reduce but do not eliminate assessment errors that result from deliberate participant self-presentation. The study design reduces its ability to prove cause-and-effect relationships because it cannot show which factor comes first between increased aggression and animal abuse. Additional research through longitudinal methods and experimental setups will produce better insight about the connection point between these variables. The chosen sample size satisfied all requirements from power analysis but the study could become more applicable to different groups by incorporating various age groups and cultural backgrounds.

Future research requires longitudinal study approaches, which follow aggression development in people showing initial indications of animal abuse behaviour. Scientific studies using blended research methods allow researchers to combine qualitative interviews with quantitative measures in order to study complex psychosocial factors of these behaviours.

A detailed investigation of empathy as both a moderator and transformative factor in Dark Tetrad trait individuals will produce stronger intervention methods to decrease animal abuse-related aggressive behaviours. The development of empathy through educational campaigns presents itself as a preventive method for populations with dark personality traits to change their violent behaviour patterns.

CONCLUSION & IMPLICATIONS FOR PRACTICE

Research findings demonstrate that animal abusers show expressions of aggression, which connect to each other through a pathway affected by the presence of Narcissistic features. The findings support present studies regarding the psychological factors of animal abuse and human aggressive conduct by showing the important role of personality characteristics.

This study brings significant benefits for practical use. Research on Dark Tetrad traits should direct policy makers and professionals to develop strategies, which aim to decrease animal mistreatment together with its associated aggressive conduct. Educational and behavioural programs should utilise early trait identification for creating profiles of aggressive behaviour while developing programs for empathy training for children as well as treatment protocols for Dark Tetrad trait individuals.

Community-based education programs, which teach emotional skills along with animal compassion help, identify the sources of aggression throughout society. A better understanding together with practical knowledge enables society to disrupt the sequential pattern from animal abuse towards interpersonal violence while also safeguarding communities and protecting animals.

Declaration by Authors

Ethical Approval: The study received ethical approval from the Ethics Committee of the University of Derby at Mediterranean College in Athens, Greece. The Committee adheres to the current ethical guidelines established by the British Psychological Society (BPS) for conducting research involving human participants.

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