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IS THIS A PSYCHOPATH'S SPORT? EXAMINING THE PREVALENCE OF DARK PERSONALITY TRAITS AND SPORTSPERSONSHIP AMONG COMBAT SPORTS ATHLETES

ABSTRACT

Due to the inherently aggressive nature of many combat sports (CS), it is sometimes assumed that athletes who participate in these disciplines possess malevolent, or 'dark' personality traits associated with a propensity to harm others (e.g., psychopathy). The present study compared the prevalence of Dark Triad personality traits (psychopathy, narcissism, and Machiavellianism) and sportspersonship attitudes between CS athletes and non-aggressive sport participants (Ultimate Frisbee [UF] players). Survey responses from 194 CS athletes and 194 UF players indicated that CS participants exhibited higher levels of psychopathy, narcissism, and Machiavellianism than UF participants. Moreover, CS athletes placed a greater emphasis on winning compared with UF players. The findings further suggest that psychopathy is negatively associated with respect towards opponents, while narcissism is positively associated with the prioritisation of winning over other factors.

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KEYWORDS

Dark Triad; Machiavellianism; Narcissism; psychopathy; sportspersonship

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INTRODUCTION

Combat Sports and the Dark Triad

The term *combat sports* (CS) denotes a category of sport involving one-to-one competitive bouts (Barley & Harms, 2021). Popular examples include boxing, karate, wrestling, and mixed martial arts (MMA), which rank among the most widely watched and practised sports globally (Barley et al., 2019). Although each CS has its own rules, most share common principles requiring competitors to defeat their opponent by executing specific techniques, forcing submission, incapacitating the opponent, or scoring more points based on actual or potential damage (Noh et al., 2015). To achieve this, athletes employ a range of offensive and defensive techniques, including striking, kicking, choking, and joint manipulation (Krabben et al., 2019). Consequently, many CS demand that athletes display physical aggression (i.e., intentional behaviour aimed at causing physical harm) to succeed in their sport (Basiaga-Pasternak et al., 2020; Nezabravka, 2015). This is most apparent in MMA, where being the more aggressive competitor and inflicting greater damage are significant determinants of victory (Collier et al., 2011). Given this reliance on physical aggression, some have speculated that CS may attract individuals with a greater inclination to harm others (Bowman, 2020). However, conflicting evidence suggests that there may not be any link between CS participation and trait aggression (see Lafuente et al., 2021 for review), with some MMA fighters stating that whilst aggression is pertinent in competition, it does not extend to behaviour outside of competition (Rosario et al., 2014). Additionally, Blomqvist Mickelsson (2020) found that participation in more traditional martial arts (e.g., jiu-jitsu) can lead to a decline in self-reported aggression among young practitioners.

Despite ongoing debate regarding the relationship between CS participation and aggression, CSs remain distinct from most other sports in that many forms – particularly striking-based disciplines – require competitors to physically harm their opponents using sanctioned manoeuvres ('illegal' methods, such as groin attacks, remain prohibited) (Basiaga-Pasternak et al., 2020). In contrast, some grappling-based CS such as judo and wrestling do not necessitate the deliberate infliction of harm. However, success in these disciplines depends on achieving and maintaining physical control through techniques that inherently carry a risk of injury, such as choking, throwing, and pinning (Myers et al., 2010; Stephenson & Rossheim, 2018). Although research has yet to examine the moral conflict individuals may experience when harming opponents in sport, evidence from social and moral psychology indicates that most people find the deliberate infliction of harm on others aversive, with empathy and moral restraint acting as key inhibitors of such behaviour (Milgram, 1963; Jolliffe & Farrington, 2004; Boardley & Kavussanu, 2011). Accordingly, malevolent personality traits that promote aggression and diminish feelings of remorse following the harm of others – such as the Dark Triad traits (Paulhus & Williams, 2002) – may enable

CS athletes to more readily engage with the physically aggressive demands of their sport.

The Dark Triad (DT) comprises three distinct but overlapping personality traits – Machiavellianism, psychopathy, and narcissism – which reflect socially offensive dispositions (e.g., selfishness, manipulateness, and callousness) at a subclinical level (Jones & Figueredo, 2013; Paulhus & Williams, 2002). Machiavellianism is characterised by persistent use of dishonesty, deception, and manipulation for personal gain (Nathanson et al., 2006). Narcissism reflects a sense of superiority, entitlement, and grandiosity over others (Morf & Rhodewalt, 2001). The psychopathic personality is defined by numerous characteristics associated with reduced behavioural inhibition, lack of remorse, callousness, and general antisocial tendencies (Paulhus & Williams, 2002). Such psychopathic traits not only encourage harmful behaviour but also enable individuals to act immorally without self-condemnation (Pletti et al., 2017). All three have been identified as predictors of self-reported violence (Pailing et al., 2014) and aggression (Dinić & Wertag, 2018; Jonason & Webster, 2010; Rogoza et al., 2022). However, the correlation between Machiavellianism and aggression is likely attributable to overlapping characteristics and intercorrelations among the traits (Ashton et al., 2009).

A clearer theoretical link to aggression can be drawn for psychopathy and narcissism. Psychopathy is associated with both reactive aggression (i.e., impulsive hostile responses to perceived threats) and proactive aggression (i.e., planned or goal-oriented behaviour that occurs without provocation; Barlett, 2016; Jones & Paulhus, 2010). Psychopaths exhibit dysfunctional impulsivity (Jones & Paulhus, 2011) and deficits in executive control (Newman, 1987), which predispose them to aggressive reactions, particularly during interpersonal conflict (Porter et al., 2006). Furthermore, psychopathic individuals display antisocial tendencies (Hare & Neumann, 2005) and a distorted sense of morality (Campbell et al., 2009), rendering their behaviour less constrained by social norms. Their limited capacity for empathy further enables both proactive and reactive aggression to occur without remorse (Wai & Tiliopoulos, 2012).

Narcissistic individuals are particularly prone to episodes of reactive aggression – often termed *narcissistic rage* – when they perceive their ego to be threatened (Jones & Paulhus, 2011). Empirical research has shown that such individuals are more likely to respond aggressively when perceived to be insulted (Bushman & Baumeister, 1998), excluded (Twenge & Campbell, 2003), or deprived of outcomes (Bushman et al., 2003). This form of aggression typically serves an instrumental purpose, enabling individuals to reassert dominance or superiority over those who challenge their ego (Jones & Paulhus, 2010). Although a direct theoretical link between narcissism and proactive aggression is less evident, narcissistic individuals tend to demonstrate reduced respect for others (Tazegül, 2017), which may facilitate aggressive behaviour under certain motivational contexts.

Is This a Psychopath's Sport? Examining the Prevalence of Dark Personality Traits and Sportspersonship Among Combat Sports Athletes

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Despite their association with socially maladaptive characteristics, DT traits have also been linked to features that may confer advantages in CS. For instance, Vaughan et al. (2018) found a significant relationship between narcissism and mental toughness (MT). MT is a multidimensional construct representing the psychological resources that facilitate performance and achievement across different contexts (Mojtahedi et al., 2021), including sport (Cook et al., 2014). Clough et al. (2002) conceptualise MT as comprising four interrelated components: perceived control over emotions and life, commitment to goal pursuit, confidence in one's abilities, and a tendency to view challenges positively. MT has been found to mediate the relationship between narcissism and resilience to stress (Papageorgiou et al., 2019), which may assist CS athletes in managing the intense stress of competition (Mojtahedi et al., 2023).

Professional athletes also tend to score higher on DT traits than amateur and non-athletes (Vaughan et al., 2018). This pattern may be partly explained by the association between dark personality traits and over-competitiveness (Vaughan & Madigan, 2021) – a characteristic that can simultaneously drive commitment and performance while increasing the likelihood of rule-breaking or ethically questionable behaviour (Muris et al., 2017). Moreover, individuals with higher levels of psychopathy demonstrate greater fearlessness (Colangelo et al., 2023; Wallace et al., 2022). Given the inherent risks of CS, the ability to manage or suppress fear is likely advantageous; thus, individuals high in psychopathy may find such sports more accessible or appealing.

Although there is clear theoretical rationale to suggest that DT traits may be more prevalent among CS athletes, this relationship remains underexplored. Greitemeyer (2022) observed an association between participation in aggressive sports and DT traits among a broad range of athletes. However, the study did not specify which sports were included, nor the extent to which CS were represented. To date, only one study by Van Hauwermeiren et al. (2023) has directly compared DT trait levels between CS athletes and non-athletes. In their study, 36 CS athletes were compared with 29 college-aged non-athletes, revealing no significant group differences in DT scores and no association between DT traits and competitive success. However, given the small and unrepresentative sample ($N = 65$), further investigation is warranted.

The Dark Triad and Unsporting Behaviour

The malevolent characteristics that underpin DT traits are also likely to promote illicit and unsporting behaviour, which not only undermines the integrity of sport but can also hinder an athlete's development and progression (Houston et al., 2015). What constitutes unsporting behaviour varies across sports due to differences in rules and behavioural expectations. Nevertheless, the concept of sportspersonship broadly reflects an athlete's general inclination towards either pro-social or unsporting conduct within their sport. Sportspersonship can be conceptualised as a multidimensional construct representing an

athlete's respect for the rules, rituals, and traditions of their discipline (Siedentop et al., 2004).

One of the most widely used measures of sportspersonship is the Compliant and Principled Sportspersonship Scale (CAPSS) (Perry et al., 2015). The CAPSS assesses sportspersonship through five dimensions: compliance with officials, compliance with rules, legitimacy of injurious acts, respect towards opponents (also referred to as *principled opponent*), and principled game perspective (the extent to which an individual prioritises winning above all else). Research exploring the relationship between DT traits and sportspersonship is limited; however, recent findings by Fozzard and Mojtahedi (2023) indicate that individuals exhibiting higher levels of psychopathic traits tend to display lower levels of sportspersonship across all CAPSS subscales.

Individuals high in DT traits often possess an inflated sense of superiority and a diminished regard for others (Nicholls et al., 2017). Consequently, they may be more willing to engage in unfair practices during competition to secure an advantage. Supporting this, Tazegül (2017) identified a negative association between narcissism and respect towards opponents. Given that success in sport is often linked to self-gain (Jonason et al., 2014), it is unsurprising that those with elevated DT traits may be more inclined to adopt a "win-at-all-costs" mentality (Nicholls et al., 2017). In line with this, Nicholls et al. (2020) found that all three DT traits were positively correlated with favourable attitudes towards doping and cheating – behaviours that have been frequently observed among CS athletes (Lazuras et al., 2024; Petrou et al., 2022).

Further studies suggest that individuals high in DT traits may exhibit a greater propensity for amoral decision-making (Muris et al., 2017) and actual cheating behaviours (Nicholls et al., 2020) in pursuit of their goals. It is therefore plausible that athletes with pronounced DT characteristics are at heightened risk of engaging in illicit or unethical practices in sport. This may be particularly true for psychopathic individuals, who are known to display reckless and impulsive behaviour (Jones & Paulhus, 2011). Accordingly, in addition to examining the prevalence of DT traits among CS athletes, it is also valuable to investigate whether these characteristics contribute to unsporting dispositions.

The Present Study

Many CS require and reward the effective use of physical aggression during competition (Collier et al., 2011). Given that DT traits have been associated with physical aggression (Pailing et al., 2014) and a lack of remorse regarding harm inflicted on others (Jones & Figueredo, 2013), it is plausible that CS may attract individuals who display higher levels of DT traits. However, there is a paucity of research examining the prevalence of DT personality within CS. The present study therefore aimed to examine the prevalence of DT personality traits among CS athletes in comparison with non-aggressive sport participants. Ultimate Frisbee (UF) players were selected as the comparison group. Although UF players differ from CS athletes in several respects that may act as potential confounding variables (e.g.,

participation in a team-based rather than individual sport), the authors considered this group appropriate for comparison given that UF explicitly prohibits physical and verbal aggression, while also rewarding prosocial conduct. Due to evidence demonstrating that males display significantly more DT traits than females (Jonason & Davis, 2018), participant gender was controlled for when examining the aims.

Given the inherently aggressive nature of CS, it was hypothesised that CS athletes would exhibit higher levels of narcissism (Hypothesis 1) and psychopathy (Hypothesis 2) than UF players. A secondary aim of the study was to examine the relationship between DT traits and sportspersonship attitudes among CS athletes. It was hypothesised that psychopathy (Hypothesis 3), narcissism (Hypothesis 4), and Machiavellianism (Hypothesis 5) would predict lower levels of sportspersonship attitudes.

METHOD

Participants

Power Calculation

The first aim of the study was to compare DT and sportspersonship scores between CS and UF samples. A priori power analysis was conducted using G*Power version 3.1.9.7 (Faul et al., 2007) for sample size estimation, based on data from Van Hauwermeiren et al. (2023; $N = 65$). The effect sizes from this study were small (psychopathy $d = .43$; narcissism $d = .36$) to negligible (Machiavellianism $d = .08$), in accordance with Cohen's (1988) criteria. The negligible effect size for Machiavellianism was a strong indication of no true difference; therefore, our sample estimations focussed on previous effects for the remaining two traits. With a significance criterion of $\alpha = .05$ and power = .80, the minimum sample size required to reliably observe these effects would be 136 (68 per group) for psychopathy and 194 (97 per group) for narcissism. A power analysis was also conducted to calculate the minimum sample size for predicting sportspersonship scores using DT traits within the CS sample (aim 2). To the authors' knowledge such a predictive model had not been tested, therefore our calculation was based on a moderate effect size ($f^2 = .15$). With a significance criterion of $\alpha = .05$ and power = .80, the minimum sample size required to reliably observe these effects was 85 responses.

Samples

The study analysed responses from 388 participants (361 males, 26 females, 1 undisclosed) with a mean age of 28.7 ($SD_{age} = 8.14$). The responses (CS = 194; UF = 194) were drawn from two separate datasets, described below.

CS athletes were recruited through social media advertisements placed in online CS community groups and through direct contact with CS athletes and coaches. The study inclusion criteria required participants to have practised a CS for a minimum of one year and to have competed in at least one competitive CS match or

tournament. A competitive match/tournament was defined as a contest whereby a winner could be declared (i.e., not an exhibition match). In total, 197 responses were recorded, however, after removing 3 responses due to the participant not having any competitive experience, the final sample of CS athletes used in the present study was 194 (180 male, 13 female, 1 undisclosed; $M_{age} = 27.80$, $SD_{age} = 6.77$). Many participants competed in multiple CS; the most frequently practised *primary* sport was MMA ($n = 81$), followed by boxing/kickboxing ($n = 59$), grappling (Brazilian jiu jitsu, wrestling, and judo; $n = 53$), and karate ($n = 1$). The authors also attempted to record the level CS athletes competed in (i.e., professional vs amateur), however, within many of the practised sports, professional competition either does not exist or cannot be objectively differentiated from amateur competition. Thus, we could only record the competition level of those who competed in boxing or kickboxing, with 73 athletes competing at professional level and 64 competing at amateur level. CS athletes varied in their training and competition experience. With training experience ranging from 1-46 years ($Median = 9$, $IQR = 10$) and competition experience ranging from 1-40 years ($Median = 6$, $IQR = 8$).

A comparison group of non-aggressive sport participants was needed to assess the degree to which CS athletes varied from other sportspersons in DT and sportspersonship. The authors utilized data from a separate study (see Fozzard & Mojtahedi, 2023) which included all necessary variable measurements within a sample of UF players. UF is a non-contact team sport, whereby teams score points by passing a disc into the opposition's end-zone. The rules strictly prohibit players from using any form of physical force or aggression against others. The occurrence of aggression and misconduct is so unlikely that referees are not used, and players self-govern matches (Robbins, 2004). This sample was considered a good comparative group due to still incorporating a strong level of competitiveness whilst not requiring any physical aggression or violence. Moreover, UF teams are scored by other teams in regard to their conduct (i.e., fairness and friendliness) with scores being used at the end of tournaments/seasons to award teams who displayed the best sportspersonship – a process that acts as a further informal social control towards prohibiting aggression and unsporting conduct.

UF players were recruited using advertisements posted around UF online community groups as well as through one of the researcher's personal network of UF players. The full dataset consisted of 828 usable responses (male = 578, female = 245, other = 5) aged 18 to 65 ($M = 26.79$, $SD = 8.64$). As with some CS, 'professional' competition in UF is limited and not easily discernible, however, players can be differentiated by the degree of competition quality which graduates from recreational ($N = 43$) to university level ($N = 192$) and club level ($N = 411$) to the highest level which was national level ($N = 182$). Player experience ranged from 1-44 years ($Median_{age} = 6$, $IQR_{age} = 6$). To ensure comparability between the two datasets, a stratified random sampling approach was used to reduce the UF sample to match the CS sample ($n = 194$), based on participants' age, gender, and level of experience in

the sport. The proportions of participants within each stratum in the CS dataset were calculated and applied to the larger UF dataset. From each stratum, participants were randomly selected until the overall sample size of 194 was achieved, maintaining equivalent distributions across the key variables. Between groups comparisons showed that participants from the matched groups were effectively matched on gender ($\chi^2[1] < .001, p = .989$), sport experience ($t [381] = .143, p = .154$), and age ($t [410.55] = .54, p = .59$).

Measures

The Short Dark Triad Scale (SD3)

DT personality traits were measured using the SD3 (Jones & Paulhus, 2014), a 27-item questionnaire used to measure sub-clinical levels of Machiavellianism, narcissism and psychopathy. Each personality trait is measured through nine statements that participants rate the agreements with using 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Example items include "Generally speaking people won't work hard unless they have to" (Machiavellianism), "People see me as a natural leader" (narcissism), and "I like to pick on losers" (psychopathy). All three constructs demonstrated acceptable to good internal consistency ($\alpha_{\text{Machiavellianism}} = .699, \alpha_{\text{Narcissism}} = .665, \alpha_{\text{Psychopathy}} = .710$).

Sportspersonship

Sportspersonship was measured using the Compliant and Principled Sportspersonship Scale (CAPSS, Perry et al., 2015). Participants respond to a list of statements using a 4-point Likert scale (1 = *strongly disagree* to 4 = *strongly agree*), which are averaged to code each respective subscale. The present study measured the principled opponent subscale (hereon referred to as *opponent*), the principled game perspective subscale (hereon referred to as *game perspective*) and the compliance with rules subscale (hereon referred to as *rules*). The subscale scores for respecting officials and the legitimisation of injurious acts were not included due to not being applicable to the sports being studied. Injurious acts were also not reflective of unsporting behaviour in CS due to the inherent requirement of physical aggression in many CS sports. All three included subscales demonstrated acceptable to strong internal consistency ($\alpha_{\text{Rules}} = .821, \alpha_{\text{Opponent}} = .695, \alpha_{\text{Game Perspective}} = .864$).

Procedure

The present study received ethical approval from the lead author's research institution. A cross-sectional design was used where participants responded to an online survey that was created and hosted on *Qualtrics* (*Qualtrics*, Provo, UT). After providing informed consent, participants were first asked a series of demographic questions that measured their gender, age, the sports that they competed in, their experience (years) in both practising and competing within their respective sports, and the level they competed at (if applicable). After completing the demographic questions, participants were then required to complete two personality questionnaires.

RESULTS

The results are presented in three parts. We first present preliminary test results which examine whether competition level (i.e., amateur or professional) has an effect on DT and sportspersonship traits of CS athletes. This was done to determine whether the competition level could be combined for subsequent analyses or whether they had to be controlled for. Next, we examined the effects of sport (UF vs CS) and gender on DT and sportspersonship traits; lastly, we present regression models that examine the association between DT personality and sportspersonship among CS participants (whilst controlling for gender).

Preliminary Analyses

A one-way MANOVA tested the effects of competition level (amateur vs professional) on CS athletes DT traits (psychopathy, narcissism and Machiavellianism) and sportspersonship attitudes (Game Perspective, Rules, and Opponent). The findings failed to find a significant effect of competition level on any of the personality traits ($F [6, 130] = .626, p = .709$; Wilk's Lambda = .97, Partial eta squared = .028). Univariate test results indicate non-significant main effects of competition level on psychopathy ($F [1, 135] = 1.01, p = .317; d = .176$), narcissism ($F [1, 135] = .01, p = .925; d = .015$), Machiavellianism ($F [1, 135] = .241, p = .625; d = .085$), Rules ($F [1, 135] = 1.32, p = .252; d = .195$), Respect for Opponent ($F [1, 135] = .255, p = .628; d = .082$) or Game Perspective ($F [1, 135] = .633, p = .428; d = .147$). The findings suggested that amateur and professional CS athletes did not differ in regard to DT personalities or sportspersonship attitudes, therefore, subsequent analyses combined CS competition groups together.

Multivariate tests for DT and Sportspersonship

A 2x2 MANOVA was conducted to determine whether participants' gender and sport had an effect on DT (psychopathy, narcissism and Machiavellianism) and sportspersonship (Game Perspective, Rules, and Opponent) scores. Descriptive data for all groups are presented in Table 1. Multivariate tests did not identify a significant interaction effect ($F [6, 376] = 1.02, p = .413$, Wilk's Lambda = .98, Partial eta squared = .02). However, significant main effects for sport groups ($F [6, 376] = 8.56, p < .001$; Wilk's Lambda = .88, Partial eta square = .12) and gender ($F [6, 376] = 4.7, p < .001$; Wilk's Lambda = .9, Partial eta squared = .07) were observed. The univariate results for both main effects are presented below.

Table 1. Mean (Standard Deviation) scores between sport and gender groups.

	<i>n</i>	Psychopathy	Narcissism	Machiavellianism	Rules	Opponent	Game Perspective
Combat Sports ¹	194	2.38 (.52)	2.93 (.55)	3.17 (.55)	3.18 (.6)	4.55 (.48)	3.01 (.68)
Male	180	2.42 (.51)	2.94 (.55)	3.19 (.55)	3.15 (.6)	3.55 (.48)	2.98 (.68)
Female	13	1.91 (.37)	2.71 (.58)	2.99 (.5)	3.46 (.52)	3.58 (.56)	3.42 (.49)
Ultimate Frisbee	194	1.97 (.45)	2.67 (.5)	2.83 (.5)	3.13 (.53)	3.4 (.46)	3.43 (.46)
Male	181	1.99 (.45)	2.69 (.48)	2.87 (.49)	3.12 (.54)	3.41 (.46)	3.42 (.47)
Female	13	1.7 (.31)	2.32 (.62)	2.4 (.45)	3.25 (.39)	3.34 (.45)	3.6 (.26)

Note: One CS participant did not disclose gender.

Gender differences

There was a significant main effect of gender found for psychopathy ($F [1, 384] = 14.28, p < .001$; Partial eta square = .04), narcissism ($F [1, 384] = 7.53, p = .006$; Partial eta square = .02), Machiavellianism ($F [1, 384] = 8.97, p = .003$; Partial eta square = .02), and Game Perspective ($F [1, 384] = 6.24, p = .013$; Partial eta square = .02), but not for Opponent ($F [1, 384] = .03, p = .856$; Partial eta square < .001), or Rules ($F [1, 384] = 3.57, p = .06$; Partial eta square = .01). Collectively, these observations suggest that male participants display higher DT traits and place greater importance on winning, compared to female participants.

Participant Sport differences

Regarding DT traits, there was a significant main effect of sport on psychopathy ($F [1, 381] = 10.88, p < .001$; Partial eta squared = .03), narcissism ($F [1, 381] = 8.98, p = .003$; Partial eta squared = .02), and Machiavellianism ($F [1, 381] = 18.92, p < .001$; Partial eta squared = .05). These findings suggest that CS athletes possess higher levels of all three DT traits, in comparison to UF participants; the magnitude of these differences was small (in accordance with Cohen, 1988).

Regarding sportspersonship, there was a significant main effect of sport on and Game Perspective ($F [1, 381] = 7.17, p = .008$; Partial eta squared = .02), but not on Rules ($F [1, 381] = 1.18, p = .277$; Partial eta squared = .003) and Opponent ($F [1, 381] = 3.78, p$

=.052; Partial eta squared = .01). The findings suggest that CS athletes valued winning over everything else (Game Perspective) to a greater degree than UF players (small effect size in accordance with Cohen, 1988), but held similar levels of respect towards their opponents and the rules of their sport.

DT predictors of CS sportspersonship

For the second aim, three linear regression models were used to determine whether CS athletes' gender (included as a control measure) and DT personality traits (psychopathy, narcissism, and Machiavellianism) could successfully predict their sportspersonship scores (Rules, Opponent and Game Perspective).

The predictive model for Rules was statistically significant ($F [4, 187] = 4.99, p < .001$) and explained 9.6% of variance. As table 2 demonstrates, athletes displaying high levels of psychopathy ($\beta = -.23$) and Machiavellianism ($\beta = -.16$) reported having less respectful towards the rules of their sport.

Table 2. Linear regression models for sportspersonship.

	Rules				Opponent				Game Perspective			
	B	SE	β	t	B	SE	β	t	B	SE	β	t
Gender (female)	.16	.38	.07	.95	-.09	.14	-.05	-.61	.27	.19	.10	1.42
Psychopathy	-.27	.17	-.23**	-2.98	-.21	.07	-.23**	-2.88	-.18	.10	-.14	-1.8
Narcissism	.11	.08	.10	1.33	.06	.07	.07	.87	-.23	.09	-.19*	-2.48
Machiavellianism	-.17	.08	-.16*	-2.08	-.09	.07	-.11	-1.41	-.17	.09	-.14	-1.92

Note: $N = 193$, * $p < .05$, ** $p < .01$.

The predictive model for Opponent was also statistically significant ($F [4, 187] = 3.22, p = .014$) and explained 6.4% of variance. Only psychopathy ($\beta = -.23$) made a significant contribution to the model, with athletes displaying high levels of psychopathy reporting less respect towards their opponents.

The predictive model for Game Perspective was also statistically significant ($F [4, 187] = 7.19, p < .001$) and explained 14.5% of variance. Only narcissism ($\beta = -.19$) made a significant contribution to the model, with narcissistic athletes placing greater importance on winning.

DISCUSSION

The purpose of this study was to examine the presence of DT personality traits (Machiavellianism, narcissism, and psychopathy) among CS athletes, and to moreover examine how these personality traits relate sportspersonship attitudes.

Sport Differences in DT and sportspersonship

Our preliminary tests revealed no differences in DT traits or sportspersonship between amateur and professional CS athletes. Although not central to the study's aims, these observations require some discussion. Our findings suggest that DT and sportspersonship may not be decisive factors in CS progression to higher levels of performance. This aligns with Van Hauwermeiren et al. (2023), who similarly reported no association between DT traits and success in CS. In contrast, research recruiting participants from a broader range of individual and team sports (e.g., boxing, karate, athletics, rugby, volleyball, and hockey) has identified associations between DT traits and greater sporting

expertise (Vaughan et al., 2019). One possible explanation for the lack of observed differences in the present study is that professional athletes may not have differed substantially from amateurs in terms of proficiency or competitive success. In the current sample, athletes self-reported their sporting status based on rule sets, experience, and whether they received payment for participation. Consequently, individuals classified as 'professional' may not necessarily have been more skilled or accomplished than amateur athletes but may instead have longer participation histories or have reached a stage in which they receive financial compensation.

The present study found that CS athletes scored higher on all three DT traits, compared to UF participants, supporting hypotheses one and two. At first glance, this finding appears to contradict the results of Van Hauwermeiren et al. (2023), who reported no significant differences in DT traits between CS athletes and 'college-aged non-fighters'. However, Van Hauwermeiren and colleagues (2023) provided no further descriptive information about this comparison group. Consequently, it is unclear whether their participants were sedentary non-athletes or individuals from other high-contact sports that may also foster DT traits (e.g., rugby; Vaughan et al., 2018). In contrast, the present study explicitly defined its control group as UF players – a population participating in a sport that prohibits physical and verbal aggression and rewards prosocial conduct. As such, the present comparison allows for clearer conclusions regarding differences in DT traits between CS and non-aggressive sports. Furthermore, Van Hauwermeiren et al. (2023) employed a substantially smaller sample ($N = 65$) than the current study, which may have limited their statistical power to detect group differences.

The significant group differences observed across all three DT traits can be interpreted in two ways. One possibility is that participation in CS increases the expression of DT traits. However, this explanation appears unlikely given that these traits tend to be relatively stable during adulthood – and in some cases decline over time (Barlett & Barlett, 2015). Moreover, no significant differences in DT traits were observed between amateur and professional CS athletes. If engagement in CS increased DT tendencies, it would be reasonable to expect higher DT scores among those with greater experience. To more conclusively test whether CS participation influences DT traits, a longitudinal research design would be required. An alternative explanation is that individuals with higher DT traits are more likely to be drawn to CS. Such environments may appeal to those with pronounced DT personality characteristics because they legitimise behaviours that align with these traits. For example, psychopathy is associated with fearlessness in the general population (Colangelo et al., 2023; Wallace et al., 2022). It is plausible that this fearlessness enables psychopathic individuals to engage more readily in situations involving interpersonal harm and personal risk, such as CS competition. Although this relationship has not yet been empirically examined within sporting contexts, it presents a promising avenue for future research. Additionally, CS require the use of aggressive actions (e.g., striking, choking, or grappling an opponent). Research has demonstrated that individuals higher in Machiavellianism and psychopathy exhibit greater aggression (Bryan et al., 2023). Accordingly, CS may attract participation from individuals with Machiavellian and psychopathic tendencies, as these contexts legitimise aggression within socially acceptable boundaries – where physical dominance and aggression are functional components of success. Supporting this interpretation, Greitemeyer (2022) found a positive association between the aggressiveness of a sport and athletes' DT trait levels. Moreover, athletes with higher DT scores reported caring less about others' well-being and showed less hesitation in harming others during sport.

CS and UF athletes also differed significantly in their game perspective, with CS athletes placing greater importance on winning, even at the expense of fairness and enjoyment. This finding is unsurprising given the recreational and socially oriented nature of UF, where losing carries minimal cost and emphasis is placed on cooperation and enjoyment (Amoroso et al., 2021). Amoroso and colleagues identified nine recurring themes within studies on UF athletes – competition, enjoyment, communication, cooperation, welfare, teamwork, environment, rules, and spirit of the game – and found that communication, teamwork, and spirit of the game were the most prevalent, underscoring the sport's social ethos. In contrast, CS typically involve the maintenance of an official record of wins and losses, with defeats permanently documented and potentially hindering progression to advanced (e.g., professional) levels. This structural emphasis on outcomes likely reinforces a heightened prioritisation of victory among CS athletes.

Average scores reflecting respect towards opponents noticeably higher among CS athletes, suggesting greater respect towards opponents; however, this difference only approached statistical significance ($p = .052$). Further data are therefore required to establish whether a true difference exists. At first glance, it may seem contradictory that individuals characterised by manipulative, narcissistic, and psychopathic tendencies would also have greater respect for their opponents. Nonetheless, many CS – particularly those rooted in traditional martial arts – explicitly emphasise discipline, humility, and respect as part of their pedagogical philosophy (Vertonghen & Theeboom, 2010). The shared physical and psychological demands of combat have also been shown to foster mutual respect, with MMA athletes often describing their contests as encounters grounded in mutual commitment, responsibility, and respect (Jensen et al., 2013; Serrano Rodrigues et al., 2021).

Gender differences

Across the total sample, male participants were found to score significantly higher on psychopathy, narcissism, and Machiavellianism. This contrasts with some previous research examining DT traits in athletes. For instance, Vaughan et al. (2018) collapsed inferential analyses across gender due to a non-significant Box's M result. However, Box's M assesses the equality of variance-covariance matrices across levels of an independent variable (in this case, gender) for the dependent variable. Therefore, it is possible for variances to be equivalent while mean scores differ between genders. Supporting this, Vaughan et al. (2019) found that males scored significantly higher on DT traits, suggesting that gender differences in these traits may indeed exist. The present study also indicated potential gender differences in sportspersonship, with males showing lower respect for the rules and placing greater emphasis on winning. These findings align with the work of Iturbide-Luquin and Elosua-Oliden (2017), who reported that female athletes scored higher on four of five sportspersonship dimensions – participation, enjoyment, respect, and commitment.

DT predictors of sportspersonship

We observed a predictive relationship between DT traits and sportspersonship, suggesting that CS athletes with higher DT traits are less likely to demonstrate good sportspersonship during competitions. However, no single DT trait predicted all three sportspersonship facets, thus our remaining hypotheses were only partially supported. Athletes scoring higher on Machiavellianism were less likely to respect the rules of their sport, consistent with the defining characteristics of this trait. Machiavellianism reflects a tendency toward manipulation, deceit, and strategic exploitation to achieve personal goals (Nathanson et al., 2006), and individuals high in Machiavellianism may therefore be more inclined to bend or violate rules in pursuit of competitive success.

Psychopathy traits were associated with reduced respect for both the rules and opponents. This aligns with the broader behavioural profile of psychopathy, which is characterized by callousness,

reduced inhibition, and a propensity to violate social and moral conventions (Paulhus & Williams, 2002). Our findings are consistent with previous research showing that DT traits can predict favourable attitudes toward cheating (Nicholls et al., 2020).

Narcissism did not predict respect for rules or opponents; however, athletes with higher narcissistic traits placed greater importance on winning. This tendency aligns with features of vulnerable narcissism, which involve a fragile sense of self-worth and a heightened need for admiration (Pincus et al., 2009). Such individuals may prioritize success as a means of reinforcing their self-image and gaining approval from others.

Although there is no evidence that DT traits impede success in CS, their association with unsporting attitudes – and with broader antisocial behaviours outside of sport – raises important questions about whether coaches and sport psychologists could do more to mitigate their negative effects. Adopting a holistic coaching philosophy may help reduce the maladaptive behaviours linked to DT traits. This approach mirrors traditional martial arts philosophies, such as *Budo* from Japanese martial arts which integrates physical combat training with moral, spiritual, and personal development and has been proposed as a valuable framework for fostering respect toward others (Tai et al., 2025). Contemporary interventions, such as life skills training, similarly aim to enhance emotional intelligence and self-control among athletes (see Danish et al., 2004; Freire et al., 2024). Coaches might also employ varied training methods, such as rough-and-tumble play, to promote self-regulatory and prosocial behaviours (Pellis & Pellis, 2007). Cultivating these broader psychosocial skills may help athletes manage intense emotions, including aggression, and reduce the influence of DT traits on social conduct (Mickelsson & Stylin, 2021).

LIMITATIONS

The first limitation concerns the generalisability and validity of the findings due to varying levels of competitive performance (e.g., professional vs. amateur). While the present study found no significant differences in outcome variable scores between professional and amateur athletes, these null findings may reflect the criteria used to define 'professionals'. Future research could benefit from employing Swann et al.'s (2015) five-variable framework which considers highest level of competition, success at highest level, experience, and national and international competitiveness. Using a more comprehensive framework would allow researcher accurately to differentiate between amateur and professional-level athletes.

Additionally, UF players were recruited as a comparison group representing sports that do not require aggression or violence to succeed. However, other differences between these groups exist, such as the need for group cohesion (team vs. individual sport) and the consequences of losing (e.g., career progression, health,

and wellbeing). A comparison group involving an individual-based, highly competitive sport (e.g., tennis) may have allowed for a more precise examination of the relationship between the violent nature of CS and DT traits.

CONCLUSION

The present study indicates that CS athletes display higher levels of DT traits compared with non-combat competitive athletes. While further comparisons with more closely matched non-CS athletes (e.g., individual-based competitive sports) may be warranted, these emerging findings lend support to previous suggestions that CS, such as mixed martial arts (MMA) and boxing, tend to attract individuals with more malevolent or 'dark' personality characteristics. Looking ahead, a valuable avenue for future research would be to objectively assess how, and to what extent, DT traits may serve as either a benefit or a hindrance to competitive success within CS.

Declaration of competing interests

The authors affirm that they had no competing interests relevant to the work underpinning this manuscript.

Declaration of artificial intelligence use

The author(s) affirm that no artificial intelligence applications were used in the preparation of this manuscript.

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