



Comparative analysis of Dark Triad traits in relation to performance and self-reported emotional intelligence

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ABSTRACT

Interest in the Dark Triad (DT) traits - Machiavellianism, narcissism, and psychopathy - and their association with maladaptive behaviors has surged in recent years. Research has focused on identifying protective factors such as Emotional Intelligence (EI), but the literature has yielded mixed results regarding this relationship. Our study seeks to explore this relationship from two distinct perspectives of EI: self-report and performance-based measures. To achieve this aim, 222 participants ($M_{age} = 22.01$, $SD = 4.54$, ages 19–60) completed the Trait Meta Mood Scale (TMMS), a self-report measure, and the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT), a performance-based assessment, to evaluate EI, and the Short Dark Triad (SD-3) was used to evaluate DT traits. Our findings revealed a significant negative correlation between the traits of psychopathy and narcissism and EI scores when using the MSCEIT. However, when utilizing the TMMS, we only identified a positive and significant association between narcissism and EI. These findings underscore the importance of considering the type of EI measurement when examining this relationship. Moreover, we identified sex differences in the study variables and found that sex plays a moderating role in the studied relationship. We discuss the limitations and clinical implications of these findings.

1. Introduction

The Dark Triad (DT) is a psychological construct composed of three independent, interrelated personality traits: Machiavellianism, narcissism, and psychopathy (Lyons, 2019). Although DT traits share a common core of selfishness, insensitivity, and manipulation (Jones & Figueredo, 2013), each trait presents its own distinctive characteristics. Machiavellianism is characterized by manipulative and deceitful interpersonal strategies rooted in a cynical core of beliefs and a pragmatic view of morality (Jones & Paulhus, 2009). Individuals high in Machiavellianism manipulate others to obtain what they want, regardless of moral considerations (Christie & Geis, 1970). Psychopathy is considered the darkest trait, characterized by egocentricity, insensitivity, difficulty forming close emotional bonds, lack of anxiety and guilt, superficial charm, and impulsivity (Cacho et al., 2020; Hare, 1991; Hare & Neumann, 2008). High psychopathy scores are related to difficulty identifying or understanding others' emotions (Visser et al., 2010). Finally, narcissism is characterized by a sense of grandiosity, excessive self-love, an illusion of control, a desire for admiration, and an overestimation of

one's abilities and successes. As expected, individuals high in narcissism are often perceived as arrogant and believe they deserve special treatment and power over others (Campbell & Foster, 2011).

Previous research indicates that high DT scores are related to specific emotional deficits. In a study with 322 participants, Jonason and Krause (2013) found that DT traits were associated with low cognitive empathy scores and difficulty in identifying and describing emotions. Specifically, affective empathy was negatively correlated with psychopathy and Machiavellianism, while no relationship was found with narcissism. Another study with 232 twin pairs revealed that DT traits were each differently related to alexithymia's components (Cairncross et al., 2013). Machiavellianism and psychopathy showed a positive and significant relationship with all components. In contrast, negative between narcissism and the components of difficulty "describing emotions" and "externalized thinking". Hence, it is logical that prior studies have examined the potential association between emotional intelligence (EI) and DT.

EI is defined as "... the ability to perceive accurately, appraise, and express emotion; the ability to access and generate feelings when they

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facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10). Emotional intelligence has been theoretically defined based on three models (Joseph & Newman, 2010): the ability/performance-based model, the self-report ability model, and the mixed self-report model. These models classify EI in various ways, although they all revolve around two fundamental conceptualizations and forms of evaluation: performance-based and self-reported. The ability/performance-based and self-report ability models both perceive EI as a mental ability, however the first one assesses EI through aptitude tests with right or wrong answers, while the self-report model measures the subjective perception of EI, with no correct answers, (see Supplementary Material A for more details). The mixed self-report model uses self-report and views EI as a more complex construct, integrating aspects of personality, motivation, intra- and interpersonal abilities. Hence, it’s less commonly used in EI studies. Research suggests that the ability model demonstrates higher convergent validity and offers more accurate predictions of behavior and performance in EI tasks (Gutiérrez-Cobo et al., 2016, 2017; Mayer et al., 2016; Megías et al., 2017).

The DT-EI relationship has been investigated extensively in recent years. There has been a rising interest in discovering a potential “dark EI” in individuals with high DT and EI scores (Austin & O’Donnell, 2013), whereby successful individuals have scored highly in emotional manipulation (Austin et al., 2007). Given that being able to successfully manipulate others has been linked to some form of EI (Austin et al., 2007; Côté et al., 2011) and that high scores for both EI and DT traits have been linked to positive life outcomes (Walker et al., 2021), curiosity has risen for a link between the two constructs, which if found conclusive, could justify potentially “training” EI to serve as a protective measure against the DT. Although there appears to be a general negative DT-EI dynamic, it varies depending on the EI measure (Walker et al., 2021). For instance, Zhang et al. (2015) identified significant negative associations between the DT and performance-based EI. With self-reports, the relationship was significantly negative with Machiavellianism, positive with narcissism, and not significant with psychopathy. The differential relationship between narcissism and the EI measures is not entirely unexpected, given the traits exhibited by individuals with narcissistic tendencies (Campbell & Foster, 2011). The sense of superiority may inflate self-perception, leading to higher scores for self-reported EI. Other studies have also found a positive relationship between narcissism and self-reported EI while finding no relationship with performance-based EI (e.g., Zajenkowski et al., 2018). There seems to be a complicated relationship between narcissism and EI, demanding further investigation (Walker et al., 2021).

Within 18 studies, Walker et al. (2021) showed a consistent negative trend with performance-based and self-reported EI for psychopathy, with more negative correlations with performance-based measures, possibly due to the socially desirable responding in self-reported tasks (Petrides et al., 2011). Gómez-Leal et al. (2018) revealed a consistent negative relationship with performance-based EI. However, studies were mixed and inconclusive with self-reported EI. Sellbom et al. (2018) propose a link between psychopathy and lack of self-reflection, making it hard to use self-reported measures. Regarding narcissism, Walker et al. (2021) found that some dimensions revealed a consistent positive relationship, whilst others consistently negative with self-reported measures. Lastly, for Machiavellianism, 14 out of 18 studies showed a negative relationship with EI. However, not all these studies used the same DT measures. Similarly, Tsirimokou et al. (2021) found a negative relationship between Machiavellianism and both EI measures.

Given these inconsistent findings, the DT-EI relationship warrants further investigation, with particular emphasis on the EI measure used. This is especially relevant for psychopathy and narcissism, as reviewed studies have reported varied and sometimes contradictory results, highlighting the need for more rigorous research to clarify these associations.

Sex is an important factor in studies on DT traits and EI. Research shows males score higher in DT traits (see meta-analysis by Muris et al. (2017)), while sex differences in EI yield mixed results. Joseph and Newman (2010) found females tend to score higher in performance-based EI, but no consistent results were found for self-reported EI.

Hence, our main objective is to reconcile mixed results and determine whether they indeed depend on EI measures. It is important to emphasize that our novel contribution lies in evaluating the same participants with both EI measures, allowing for EI to be a potential protective factor, for instance, in the case for the highly researched DT: narcissism. Also, using different EI measures allows for a more detailed exploration of the DT-EI dynamic. Lastly, we will examine sex differences in DT-EI relationship. The hypotheses proposed are: (1) Machiavellianism will be negatively related to EI (both self-reported and performance-based); (2) psychopathy will be negatively related to performance-based EI, while the relationship between psychopathy and self-reported EI will be explored; (3) Narcissism will be positively related to self-reported EI, while the relationship between narcissism and performance-based EI will be explored; and (4) The scores for all DT traits will show significant sex differences, with males consistently scoring higher in all traits. We also anticipate that females will demonstrate higher EI scores than males when using the performance-based instrument, while the hypothesis for sex differences in self-reported measures remains open. Using an exploratory approach, we will analyze whether the relationship between DT traits and EI depends on sex and assess the combined influence of different EI factors on DT.

2. Method

2.1. Participants

Data were collected from 222 university students from the University of Málaga, Spain ($M_{age} = 22.01$, $SD = 4.54$, age range 19 to 60 years; female 77.5 %). Before voluntary participation, participants were informed about the confidentiality and anonymity of their responses, and they signed a consent form. The research project (B1-2021_10) included in this study received approval from the University Of Málaga ethics committee under the designation (approval number: CEUMA 14-2019-H).

2.2. Procedure and instruments

Data was collected using the online platform LimeSurvey (<http://limesurvey.org>). Participants completed the following instruments:

The Mayer and Salovey Caruso Emotional Intelligence test (MSCEIT; Mayer, 2002) measures performance-based EI. Based on the Mayer and Salovey model, EI is considered an ability measured across four branches: emotional perception, facilitation, understanding, and managing. The MSCEIT provides a score for each branch and a total EI score. The test contains 141 items. We used a Spanish version (Extremera et al., 2006), which has demonstrated similar psychometric properties to the original version (Cronbach’s $\alpha = 0.95$; Mayer et al., 2003). Our investigation showed excellent properties (Cronbach’s $\alpha = 0.96$).

The Trait Meta Mood Scale (TMMS-24) is a self-reported EI measure (Salovey et al., 1995). The scale with 34 items comprises: attention, clarity, and repair. Each factor is scored individually, but there is no total EI score. Participants rate their level of agreement with each statement according to a Likert scale. The Spanish version was used, which has good psychometric properties (attention, $\alpha = 0.87$; clarity, $\alpha = 0.81$; repair, $\alpha = 0.76$) (Fernández-Berrocal et al., 2004). Our investigation showed similar properties (attention, $\alpha = 0.90$; clarity, $\alpha = 0.91$; repair, $\alpha = 0.84$).

The Short Dark Triad (SD-3, Jones & Paulhus, 2014) is a self-reported DT measure. It contains 27 items, 9 for each trait. Participants use a Likert scale to indicate their level of agreement with each statement. We used the Spanish version, which has shown acceptable psychometric

properties, ranging from $\alpha = 0.61$ to $\alpha = 0.80$ (Pineda et al., 2020). Our investigation showed similar values (ranging from $\alpha = 0.67$ to $\alpha = 0.76$).

2.3. Statistical analysis

First, we conducted descriptive analyses of the variables under investigation. Before proceeding with the main analyses, we assessed the assumption of normality and homogeneity of variances. Although Levene's test indicated homogeneity of variances ($p > .05$), the Shapiro-Wilk test revealed that some variables did not follow a normal distribution ($p \leq .05$). Thus, non-parametric analyses were conducted. Second, considering the expected influence of sex on DT traits and EI, we performed Mann-Whitney *U* tests to examine differences between males and females. Third, we computed Spearman correlations between DT traits and performance-based and self-reported EI. Additionally, a multiple regression analysis with bootstrapping was performed to explore the combined effects of EI measures. Self-reported and performance-based EI scores were analyzed for their unique contributions, while age and sex were included as covariates to control for confounding effects. Finally, to explore the impact of sex in more detail, we conducted moderation analyses to investigate how sex influences the EI-DT relationship. The analyses were conducted using the SPSS 25 program (IBM Corp., USA) for the Mann-Whitney *U* tests and Spearman's correlations, while regression and moderation analyses were conducted using the non-parametric bootstrapping method (5000 samples, 95 % percentile confidence interval) with the IBM AMOS 26.0 software (IBM corp., USA) and SPSS PROCESS (model 1) macro 3.4 (Hayes, 2018).

3. Results

Table 1 displays descriptive statistics and Mann-Whitney *U* tests for all variables examined in the study, along with Rank-Biserial Correlation to examine significant sex differences. Sex differences were observed for DT traits and EI. Concerning DT traits, males scored significantly higher

Table 1
Means, standard deviations (SD), and *t*-tests for sex differences in all the study variables.

	Total Sample Mean (SD)	Male Mean (SD)	Female Mean (SD)	Sex differences	
				Mann-Whitney <i>U</i>	<i>R_b</i>
Machiavellianism	23.35 (5.93)	25.59 (6.78)	22.81 (5.58)	2724*	0.23
Narcissism	23.49 (5.51)	25.59 (5.17)	22.58 (5.41)	2457*	0.30
Psychopathy	16.62 (4.98)	19.02 (4.95)	15.93 (4.63)	2183*	0.38
SD3- total	63.50 (13.05)	70.20 (13.75)	61.31 (12.08)	2142*	0.40
Perception (MSCEIT)	108.14 (12.67)	104.08 (16.58)	109.31 (11.28)	3016	0.14
Facilitation (MSCEIT)	95 (12.57)	92.81 (12.09)	95.91 (11.94)	2911	0.17
Understanding (MSCEIT)	108.13 (10.23)	109.68 (9.71)	108.37 (9.39)	3135	0.11
Managing (MSCEIT)	109.51 (13.69)	107.31 (11.25)	111.84 (11.37)	2555*	0.28
MSCEIT total	105.19 (9.09)	102 (10.7)	106 (8.42)	3141*	0.25
Attention (TMMS)	3.46 (0.80)	3.26 (0.71)	3.52 (0.83)	2944	0.17
Clarity (TMMS)	3.21 (0.82)	3.33 (0.87)	3.18 (0.80)	3213	0.09
Repair (TMMS)	3.15 (0.75)	3.25 (0.66)	3.12 (0.77)	3263	0.07

R_b: Rank-Biserial.
* $p < .01$.

in all three. Regarding EI, females showed significantly higher scores in MSCEIT total and managing. Finally, TMMS measures were not significantly different between males and females.

Spearman correlations (Table 2) showed significant relationships between EI (MSCEIT, TMMS) and DT traits. Narcissism correlated negatively with total MSCEIT and emotional perception/management ($p < .05$). Psychopathy showed a negative correlation with total MSCEIT and perception, facilitation, and management ($p < .05$). The total DT score (SD-3) correlated negatively with MSCEIT and its branches ($p < .05$), except understanding. In TMMS, only narcissism showed positive correlations with attention, clarity, and repair ($p < .05$), while the total SD-3 score correlated positively with clarity ($p < .05$). Few correlations between EI components were found.

A multiple regression analysis was conducted to examine the relation of TMMS and MSCEIT on DT traits. Self-reported and performance-based EI measures were included as predictors to evaluate their unique contributions to DT traits, while controlling for potential confounding effects (age and sex). When psychopathy was the dependent variable, the EI significant variable included in the final model was the Managing Emotions branch of the MSCEIT ($\beta = -0.20$, CI [-0.16, -0.02], $p < .05$). This model explained 13 % of the variance ($R^2 = 0.13$). For narcissism as the dependent variable, significant predictor included Repair ($\beta = 0.23$, CI [0.66, 2.65], $p < .01$) from the TMMS. The model accounted for 18 % of the variance ($R^2 = 0.18$). For Machiavellianism as the dependent variable, significant predictor included Clarity ($\beta = 0.18$, CI [0.08, 2.48], $p < .05$) from the TMMS. The model accounted for 7 % of the variance ($R^2 = 0.07$).

Concerning the possible moderating effect of sex, the results indicated that sex moderated the relationship between MSCEIT Total score and SD-3 Total score ($\beta = -0.38$, CI [-0.77, -0.01], $p < .05$). This relationship was evident only in females ($\beta = -0.34$, CI [-0.56, -0.12], $p < .05$). Additionally, sex also moderated the relationship between emotional perception and understanding of MSCEIT score and SD-3 Total score ($\beta = -0.26$, CI [-0.52, -0.00], $p < .05$ and $\beta = -0.36$, CI [-0.70, -0.02], $p < .05$), with these relationships occurring only in females ($\beta = -0.20$, CI [-0.37, -0.04], $p < .05$ and $\beta = -0.22$, CI [-0.42, -0.03], $p < .05$). No other moderation was significant.

4. Discussion

This study aimed to examine the relationship between the DT and performance-based and self-reported EI. Discovering a negative DT-EI relationship, along with the idea of EI being potentially trainable, could serve as a protective measure to mitigate the negative consequences of the DT. Several studies on EI and interpersonal relations by Schutte et al. (2001) showed higher levels of EI were related to better social skills, cooperative behaviors and affectionate relationships, all of which are not typically DT-related characteristics. Hence, we sought to determine whether this relationship varies depending on the EI measure. For psychopathy, a negative relationship was found with performance-based EI, although non-significant with self-reported EI. Narcissism was negatively associated with performance-based EI, positively with self-reported EI. Additionally, Machiavellianism and EI were not significantly related, regardless of EI measure. Lastly, we observed sex differences in both DT and EI.

Our first hypothesis is partially confirmed. We found no relationship between Machiavellianism and either EI measures. Although previous studies show inconsistent findings, many support a negative DT-EI association (see metaanalyses by Tsirimokou et al., 2021). However, our regression analysis shows that Machiavellianism is significantly predicted by self-reported measures, concretely for clarity (TMMS). Thus, our findings require replication across future studies to draw firm conclusions regarding the relationship between these constructs.

Our second hypothesis is confirmed. We observed a negative relationship between psychopathy and performance-based EI, whilst nonsignificant with self-reported EI. Previous research has consistently

Table 2
Spearman correlations between DT traits and EI scores assessed using the TMMS (self-report) and MSCEIT (performance-based).

	1	2	3	4	5	6	7	8	9	10	11	12
1. Machiavellianism (SD-3)	–											
2. Narcissism (SD-3)	0.35**	–										
3. Psychopathy (SD-3)	0.50**	0.42**	–									
4. SD-3 Total	0.80**	0.75**	0.78**	–								
5. Perception (MSCEIT)	–0.11	–0.17*	–0.16*	–0.18**	–							
6. Facilitation (MSCEIT)	–0.12	–0.11	–0.20**	–0.18**	0.52**	–						
7. Understanding (MSCEIT)	–0.05	–0.13	–0.06	–0.03	0.15*	0.16*	–					
8. Managing (MSCEIT)	–0.09	–0.16*	–0.23**	–0.18**	0.30**	0.36**	0.18**	–				
9. MSCEIT Total	–0.08	–0.20**	–0.20**	–0.19**	0.70**	0.76**	0.45**	0.70**	–			
10. Attention (TMMS)	0.02	0.17*	0.00	0.09	–0.09	0.06	–0.00	0.10	0.04	–		
11. Clarity (TMMS)	0.11	0.24**	0.04	0.17*	0.10	0.25**	0.07	0.06	0.19**	0.33**	–	
12. Repair (TMMS)	–0.02	0.31**	–0.10	0.09	0.02	0.08	–0.11	–0.02	0.02	0.11	0.32**	–

* p < .05.
** p < .01.

shown a negative relationship with performance-based instruments (Megías et al., 2018). It aligns with the notion that individuals with high psychopathy scores do not adequately perceive emotions in others, fail to employ strategies to facilitate emotion-related thinking processes and struggle to manage their emotional states. It is unsurprising that these individuals present poor EI (Jonason & Krause, 2013). The second finding suggests individuals with high psychopathy scores perceive themselves to have a significantly different level of EI to their objective EI, consistent with the idea that high psychopathy scores often relate to emotional deficits which interestingly, are not perceived in the same way by the individuals themselves (Gómez-Leal et al., 2018). According to our regression analysis, psychopathic tendencies are significantly predicted by emotional management scores (MSCEIT), which solidifies previous research on psychopathy being related to emotional deficits, suggesting that emotional regulation and implications of practical application of EI may be more relevant for psychopathy.

Our third hypothesis is confirmed. Narcissism demonstrates a positive relationship with self-reported EI, whilst negative with performance-based EI. The first is not surprising due to the inflated self-perception, combined with the need for admiration in the case of narcissism. The later could be attributed to the core characteristics of narcissism- egocentrism, lack of empathy, and difficulty in accepting criticism-, which could hinder the development and expression of emotional intelligence in individuals with narcissistic traits (Campbell & Foster, 2011). Interestingly, we could argue that training EI in individuals with high scores for narcissism might serve as a potential protective factor for its self-serving, non-empathetic nature. Therefore, individuals with high scores for narcissism tend to have a significantly different perception of their EI compared to the objective EI measure. This discrepancy is unsurprising as narcissistic tendencies often manifest in a grandiose self-image, leading to an overestimation of emotional abilities, contrary to performance-based assessments where deception or misrepresentation is less likely (Campbell & Foster, 2011). Lastly, our regression analysis revealed that narcissism is significantly predicted by self-reported measures, concretely for repair (TMMS). This suggests that individuals with narcissistic traits have more awareness or might overestimate their emotional abilities. It seems that individuals with high narcissism scores sense to some extent the perception others have of them (Carlson et al., 2011) and tend to have a more positive perception of themselves compared to how others would evaluate them (John & Robins, 1994). This does pose the question of the validity of self-reported measures for narcissism, although this result contributes to current research of findings which reveal significant discrepancy between performance and self-reported EI measures regarding this trait (Zhang et al., 2017). Hence, our results confirm that the EI measure appears to affect the DT-EI dynamic. Also, importantly, very few significant correlations were found between EI measures themselves giving strength to the DT-EI dynamic.

Our fourth hypothesis is confirmed. Results revealed males obtained

higher scores than females across all DT traits. These differences align with findings reported in other studies (see the meta-analysis by Muris et al., 2017). Norm-violating behavior has been observed to be more prevalent in males than females, starting from childhood, with males exhibiting higher rates of delinquency, violence and antisocial personality disorder (Cale & Lilienfeld, 2002; Moffitt et al., 2001; Rowe et al., 1995). Therefore, it is not surprising that males score higher on DT traits, given these disrupting behaviors likely correlate with the deceitful and self-serving nature of the DT.

Regarding EI, we found that females obtained higher scores in performance-based EI than males, suggesting females possess a deeper understanding of emotions, express positive and negative emotions more readily and frequently, demonstrate enhanced interpersonal skills, and display greater social adeptness (Brody & Hall, 2000; Ciarrochi et al., 2005; Hall & Mast, 2008). However, we did not find sex differences in self-reported measures. These results align with previous research indicating females tend to underestimate their perceived emotional abilities while males overestimate them (Salguero et al., 2015). Since males do present a greater tendency to manifest DT traits, it might not be surprising that with higher scores for narcissism, they would overestimate their emotional abilities relative to females who have lower narcissism scores overall.

Finally, we found moderation effects of sex in the DT and performance-based EI relationship. Most of our results suggest a predominant negative relationship between EI and DT traits amongst females. These sex differences are supported by biological and societal explanations for these differences (Barrett et al., 2000) and may significantly impact how EI interacts with the DT between sexes. A plausible explanation may be that females use EI in different ways. Can we detect the DT the same way in both sexes? Another interesting aspect might be the expression and detection of DT traits in different cultures in relation to EI, and how this could also affect the DT-sex relationship. Our findings emphasize the importance of considering sex differences in future research and interventions targeting emotional and interpersonal functioning.

Regarding limitations, the characteristics of our sample limits the generalizability of our findings. The self-reported SD-3 could be influenced by social desirability bias (Anastasi, 1982), similarly to the TMMS, which has not been used extensively alongside the DT (Bru-Luna et al., 2021; O'Connor et al., 2019). Furthermore, these results should be replicated with other EI self-reported measures due to the difference in sampling domain used by each one. Besides, the accuracy of self-reported measures, especially for high narcissism scores, is not clear (Walker et al., 2021). Future research could focus on continuing to understand the DT-EI relationship, as well as investigating objective DT measures, EI training programs serving as potential primary prevention of negative effect of the DT. Interventions focused on EI in individuals with high DT traits could contribute significantly to their well-being (Gómez-Leal et al., 2019). Finally, due to our cross-sectional

methodology, it was not feasible to determine causality between variables. Alternative experimental designs will be required to validate our findings.

5. Conclusion

This study found a negative relationship between psychopathy, narcissism, and EI in performance-based assessments but not in self-reports. Additionally, we identified sex differences in the study variables. Therefore, the nature of the association between DT traits and EI may vary according to sex and EI measures. Based on our findings, performance-based EI could be a potential protective factor against the typical DT associated behaviors, such as aggression, impulsivity, and deceit tactics (e.g., Cacho et al., 2020; Hare, 1991; Hare & Neumann, 2008).

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CRedit authorship contribution statement

Louana Marie Denogent: Writing – review & editing, Writing – original draft, Investigation. **Alberto Megías-Robles:** Software, Methodology, Investigation, Conceptualization. **Pablo Fernández-Berrocal:** Methodology, Investigation, Conceptualization. **Raquel Gómez-Leal:** Writing – review & editing, Methodology, Conceptualization.

Material statement

Access to the materials utilized in this study cannot be provided due to licensing restrictions.

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Declaration of competing interest

The authors of this article declare no conflict of interest.

Data availability

Data will be made available on request.

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