BI Norwegian Business School

It contains the accepted and peer reviewed manuscript to the article cited below. It may contain minor differences from the journal's pdf version.

The Tetradic Heart of Darkness: Comparing three dark-side instruments.

Adrian Furnham[1] & George Horne[2]

[1]Department of Leadership and Organizational Behaviour, Norwegian Business School, Oslo, Norway

[2]Department of Psychology, University of Bath, Bath, United Kingdom

Address of author: adrian@adrianfurnham.com

Abstract

In this two-study paper we examined three dark-side measures: the short Dark Tetrad measuring four dark-side traits; the SCATI measuring 14 personality disorders (PDs) and the SAPAS a single item measure for each disorder. The first study (N=502) looked specifically at the new Dark Tetrad. Over 500 British Adults completed it and a confirmatory factor analysis confirmed the Tetrad factor structure. There were large sex differences in half of the items. We also examined demographic, ideological and self-rated correlates which showed ratings of political beliefs and self-rated attractiveness associated with different traits. The second study (N=273) looked at the correlations between the three measures and the overlap between self-report tests of the same trait. All four of the Tetrad traits correlated with over half of the PDs. We found the highest correlation between the two scores of Narcissism, but that the single measure most associated with Borderline, Depressive and Dependent PD. The discussion considers the use of different clinical and sub-clinical instruments which measure the same variables.

Key Words: Tetrad; Triad; Self-evaluation; personality disorders; narcissistic, schizoid.

Word Count: 7600

Introduction

Since the millennium there has been an exponential interest in, and subsequent publications concerning, the "dark-side" of personality (Andersen et al., 2021). The concept and early measures are due largely to the work of Hogan and Hogan (1997) and Paulhus and Williams (2002). Indeed, it seems that Hogan et al. (1980) was the first to use the term "dark-side" with respect to personality traits forty years ago.

The aim of this study was to examine a new measure which adds a trait (Sadism) to the Dark Triad to make it the Dark Tetrad. It also looked at the relationship between three measures of the personality disorders (PDs). For some time, the dark-side literature has been dominated by the Dark Triad, and more lately by the Dark-Tetrad, and not the full list of PDs as specified by any of the more recent DSM manuals (American Psychiatric Association., 2015). The aim of the study was first to examine the structure of the recent Dark Tetrad while the second examined its relationship with a short valid measure of all fourteen of the PDs, as well as a one-item per PD measure which gives an overall score. In addition to this we examined demographic, ideology (religious and political beliefs) and self-rating correlates of the Dark Tetrad.

The Hogans developed a measure called the *Hogan Development Survey* (HDS) which measures subclinical manifestations of the PDs based on the DSMIV-R classification of the personality disorders (PDs) (Hogan & Hogan, 1997). The measure has been used extensively in consulting but also in over 50 academic papers usually associated with leadership and management failure (Furnham, 2021). Nearly twenty years ago Paulhus and Williams (2002) combined prominent measures of the most prominent dark side traits that they identified and called the Dark Triad. The subsequent research in this area has been in various subdisciplines

including evolutionary psychology, personality theory and social psychology (Furnham et al., 2013; .

None of the dark-side measures have been developed for the clinical assessment of the PDs. They are primarily designed to assess dysfunctional interpersonal themes which reflect distorted beliefs about others, that emerge when people encounter stress or stop considering how their actions affect others. Over time, it is argued, these dispositions may become associated with a person's reputation and can impede social relationships Hogan and Hogan (1997) claim they are not a form of medical or clinical assessment as they assess self-defeating expressions of normal personality, and which could be thought of as *sub-clinical* manifestations of the PDs as many use similar terminology.

The growth in interest using various measures (particularly the Dark Triad) has been astonishing with 700 papers being published in 2019 alone (Andersen et al., 2021). Their analysis indicated that the research divides into five general themes: Sex, Gender, and Relationships; Pathology, Organizational Psychology, Social Consequences, and Mental Systems. As a result, there have been systematic reviews (Furnham et al., 2013; Koehn et al., 2019) and meta-analyses (Muris et al., 2017) looking at the breadth of the field and the clusters of topics within it as well as other bibliometic work (Dinić & Jevremov, 2019).

At the same time there have been rigorous debates about the PDs particularly with the publication of DSM-V (APA, 2013). There have been numerous calls for reclassification, the dropping of some (i,e. Histrionic PD), the re-introduction of others (i.e Sadistic PD) as well as the inclusion of yet others (i.e. Hoarding PD) (Tyrer et al, 2010).

There has also been a growth of, and interest in, the measure of specific PD and all PDs by questionnaire and interview (Lange et al., 2012) In their comprehensive review of over 50 measures Furnham et al. (2014) concluded that there are multiple options of assessment going

from general screening to differentiated (clinical) diagnostics, depending on the objectives of users which may largely vary, and also that methods may differ in terms of whether they assess primarily pathological trait variance or also tap into general traits.

Dark Tetrad

As noted above, the Dark Triad literature has spawned many different measures from the very short, namely the Dirty Dozen (Johanson & Webster, 2010) to the SD3 (Short Dark Triad)(Jones & Paulhus, 2013), which are both short measures. This study is about the Dark Tetrad which is conceptually not new, as the term and the terminology can be traced back to Chabrol et al. (2009); however the measure examined in this study is new.

As part of the scale development Paulhus et al (2020) reported on an exploratory factor analysis (EFA) to a diverse 48- item pool which revealed a separate sadism factor. In another study they did a confirmatory factor analysis (CFA) of the final selection of 28 items which showed acceptable fit for a four-factor solution as well as coherent links with the Big Five and adjustment.

The central feature of the Short Dark Tetrad (SD4) is the addition of sadism. Sadistic individuals have poor behavioral controls, shown by a short temper, irritability, and low frustration tolerance. They are hostile, manipulative, lacking in empathy, cold-hearted, and abrasive to others, particularly those they see as their inferiors. They are also cognitively rigid and prone to social intolerance, and to seek social positions that enable them to exercise their need to control others. The trait has recently attracted a good deal of research interest (Buckels et al., 2014, 2018)

Sadism has had a "mixed history" in the DSM manuals. It appeared briefly as a personality disorder in DSM-III but then "disappeared". Currently there is reference to sexual sadism and the suggestion that it may be either a conduct disorder or more simply a facet of psychopathy.

Myers et al., (2006) believed it was dropped from the DSM because of overlap with other traits as well as absence of psychometric data confirming its reliability and validity.

Study 1: Examining the Dark Tetrad (SD4)

The first study looks at the psychometrics and correlates of the SD4. When conceived and executed we could find no other studies that had looked at the factor structure of the SD4. Though we have become aware of some more recently (Hughes & Samuels, 2020; Kay 2021). Pajevic et al., (2018)

   Recently Neumann et al. (2021) found good evidence for the factor structure of the SD4. They used various factor analyses and found evidence of the original structure particularly in the parcels. that maximized item information They also found interesting sex differences: males scored higher than females on all traits except Machiavellianism. Paulhus et al. (2021) found sex differences on each of the four scales particularly Sadism. Two dark traits – psychopathy and sadism – were strong predictors of self-reported aggression. Schizotypy added incrementally to the Dark Tetrad in predicting both self-report and behaviorally measured aggression.

   Nearly all studies on dark-side traits report sex differences which will be explored in these two studies. All the DSM manuals note suggests that there are sex differences in many disorders particularly Narcissistic, Anti-Social, Schizotypal and Obsessive–Compulsive. In a study of the HDS with over 18,000 participants Furnham and Trickey (2011) found sex differences on most disorders particularly Avoidant, Schizoid and Anti-Social with males scoring higher on the latter two. Females scored higher on Borderline, Avoidant, Passive–Aggressive, Obsessive Compulsive and Dependent and smallest sex differences were found for Paranoid, Obsessive–Compulsive, Schizotypal, Passive–Aggressive and Histrionic disorders.

Interestingly Jonason and Davis (2018) found the dark-triad also predictably associated with gender-role: psychopathy and Machiavellianism were associated with less femininity and narcissism and psychopathy were associated with more masculinity.

In the first study we investigate the factor structure and sex differences in a large adult population confirming the structure of the SD4. We expected to find sex differences on all four traits with males, scoring higher than females, as has been found before.

We also examine ideological (religious and political beliefs) and self-ratings (attractiveness, health, IQ and EQ) of the Dark Tetrad. Previous studies like Furnham and Grover (2020) demonstrated how these measures were inter-rated. We hypothesised that Narcissism would be correlated positively with the individual and total self-rating but particularly with attractiveness. We also predicted that those were more religious and had more conservative political beliefs would score higher on all four dark tetrad traits.

Method

Participants

In total, 502 participants from the United States completed the questionnaire, of which 53% were female (age range = 19 to 76 years, M = 31.6 years, SD = 13.5). In all 27% had a high school level of education, 48% held an undergraduate degree, and 21% had some postgraduate qualification.

Measures

1.*The Short Dark Tetrad* (Paulhus et al., 2020). This is a 28 item measures that assesses Narcissism, Machiavellianism, Psychopathy and Sadism. We calculated the alphas in this study and they were *Crafty* (Machiavellianism) .650; *Special* (Narcissism) .809; *Wild* (Psychopath .787; *Mean* (Sadism) .787.

2. *Personal Ratings.* Participants rated their beliefs on three scales: Religiousness (1=Not at all; 9 Very); M=2.25, SD=2.31; Politics (1=Conservative; 9= Liberal) M=5.97, SD=1.68; Optimism (1=Not at all; Very=9 M=5.10, SD= 1.94). Most were employed in a variety of skilled and professional jobs. They rated themselves well on four 100 point scales from 0=very low to 100=very high: Attractiveness M=56.63, SD=19.70; Health M=65.54, SD=21.28; IQ M=88.67, SD=20.04; EQ M=84.94, SD=25.28. These were combined into a total score with an alpha of .61

Procedure

Ethics permission was sought and received (CEHP/514/2017). Participants were recruited through Prolific.ac, an online participant database. Participants below the age of 21 were excluded from recruitment, in addition to those who had been who have been long-term unemployed, both because of the recommendations of the ethics committee and as our previous work showed they were unreliable in their responses. There were 12 in all that were excluded. The survey took an average of 11 minutes to complete and participants were paid £1.20 after completing the survey.

 Results .

Confirmatory Factor Analysis: The 28 Dark Tetrad items were first assessed for their multivariate normality using R's *mvn* package (Korkmaz et al., 2019). All multivariate and univariate tests reported non-normality at p<.001. Therefore, unweighted least squares estimation, polychoric correlation matrices were used in model calculation for the best accuracy (Holgado-Tello et al., 2010), in addition to oblimin rotation.

The original CFA model created by Paulhus et al. (2020) was analysed and fit statistics calculated [X^2= 1275.282, df=344, X^2/df=3.71, CFI= .941, RMSEA=.074(.070, .078),

SRMR=.080; See Figure 1   Error variances were set to 1.00 however the error variances for each latent variable are not shown in this figure.

This was similar, if not a slight improvement to the original studies reported fit statistics for the equivalent model [X^2= 1691,.71, CFI= .941, RMSEA=.077(.073, .080), SRMR=.07]. Inspection of modification indices suggests that P4 "I tend to dive in, then ask questions later" had the most overlap with the Narcissism factor; S7 "I know how to hurt someone with words alone" also mapped onto the Narcissism factor with both items perhaps already referring to a(n over)confidence in one's own abilities. However, as none of these were noted as in Paulhus et al. (2020) original exploratory factor analyses these were considered artefactual, and no changes were made to the original model.

Figure 1. Confirmatory Factor Analysis of the Short Dark Tetrad
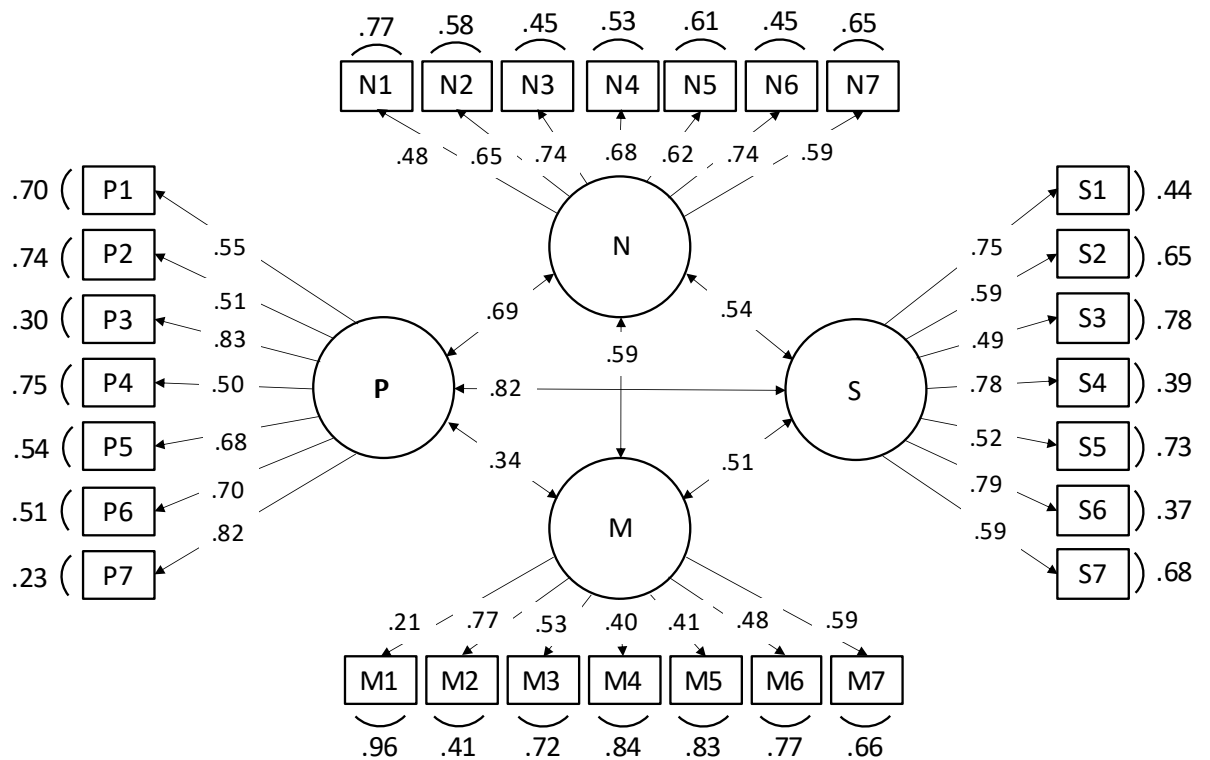
Sex Differences. We did an item and subscale score ANOVA to explore sex differences. All four were significant: Crafty ($F(1,498)=7.99$, $p<.01$) with 2/7 of the questions significant at p<.001; Special ($F(1,498)=16.16$, $p<.001$) with 4/7 of the questions significant at p<.001; Wild ($F(1,498)=12.86$, $p<.01$) with 4/7 of the questions significant at p<.001; Mean ($F(1,498)=68.24$, $p<.01$) with 7/7 of the questions significant at $p<.001$. In every case of a significant difference at trait and item level males scored higher than females. The DT is clearly a male domain.

Table 1: Correlations between the Dark Tetrad and the demographic, ideological and self-rating variables.

	Mean	SD	Mach	Narc	Psycho	Sadism	Sex	Age	Religion	Political	Optimist	Attract.	Health	IQ	EQ
Mach	42.30	9.34													
Narc	30.86	11.20	.43***												
Psycho	22.60	10.92	.26***	.54***											
Sadism	26.44	12.27	.41***	.40***	.60***										
Sex	1.49	.50	-.13**	-.18***	-.16***	-.35***									
Age	51.39	216.15	.02	.03	-.03	-.05	-.03								
Religion	2.25	2.32	.03	.13**	.01	-.10*	.03	-.03							
Political	5.97	1.68	-.07	-.09*	.04	-.09*	.05	-.01	-.30***						
Optimist	5.10	1.94	.06	.34***	.10*	-.01	-.02	.02	.17***	-.02					
Attract	56.63	19.71	.10*	.43***	.24***	.11*	-.14**	.01	.06	.03	.35***				
Health	65.54	21.28	.02	.23***	.06	.01	-.13**	.03	.02	.03	.32***	.52***			
IQ	88.08	20.05	-.01	.05	-.10*	-.07	-.12**	-.11*	-.05	.02	-.17***	.11*	.02		
EQ	84.02	25.29	-.05	.04	-.08	-.11*	-.04	-.07	.01	.01	-.09*	.12*	.00	.70***	

N=501, ***p<.001, **p<.01, *p<.05

Table 2: Multiple Regressions with the Tetrad as Criterion variables and the individual difference factors as predictor variables. (N=502)

	Machiavellianism				Narcissism				Psychopathy				Sadism			
	B	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*
Sex	-1.95	.857	-.105	-2.286**	.2.51	-.112	-2.801**	-4.364**	-3.14	.962	-.145	-3.268**	-8.375	1.041	-.341	-8.042**
Age	.001	.002	.013	0.280	.000	.002	.0260	0.064	-.002	.002	-.049	-1.120	-.004	.002	-.079	-1.882
Religiousness	.035	.197	.0086	0.176	..224	.206	.046	1.084	.007	.221	.002	0.033	-.789	.239	-.121	-3.301**
Liberalism	-.387	.261	-.069	-1.447	-.565	.273	-.085	-2.069**	.246	.293	.038	0.084	-.882	.317	-.035	-2.785**
Optimism	.181	.243	.038	0.077	1.365	.255	.239	5.362**	.054	.272	.010	0.197	-.220	.295	-.035	-0.747
Attractiveness	.049	.026	.104	1.888	.187	.027	.330	6.809**	.154	.029	.279	5.244**	.089	.032	.142	2.791**
Health	-.026	.023	-.058	-1.087	-.011	.025	-.020	-0.474	-.047	.026	-.092	-1.787**	-.041	.037	-.070	-1.423
IQ	.101	.030	.022	0.339	.045	.032	.081	1.430	-.068	.034	-.126	-2.022*	-.052	.037	-.085	-1.429
EQ	-.026	.023	-.070	-1.105	-.022	.024	-.050	1.912	-.017	.026	-/040	-0.659	-.044	.028	-.089	-1.541
Adjusted R^2	.032				.243				.085				.165			
F	1.76				18.292				6.01				11.655			
p	.014				.244				.000				.000			

N=502 **p<01 *p<05

Correlational and Regression Analysis: Table 1 shows the correlations between the four factors which are predictably positive, the highest being between Machiavellianism and Sadism, and the lowest between Machiavellianism and Psychopathy.

These four scores were correlated with the total self-rating and only Narcissism was significant as predicted (*r*=.26, *p*<01, *N*=490). When inspecting correlations with the four ratings which made up the total score self-rated Attractiveness correlated significantly positively with all four measures while self-rated intelligence was negatively rated with Psychopathy (r=-.10) and self-rated emotional intelligence negatively correlated with Sadism. The highest correlation of r=.47 was between self-rated Attractiveness and Narcissism.

Table 2 shows the results of four regressions, showing the third step onto the summed factor scores.. First, we entered demography (age and sex), then ideology (religious and political beliefs, optimism) and then the four self-ratings. Results showed the predictor variables accounted for very different amounts of the total variance from 3% for Machiavellianism to 24% for Narcissism. The correlational results suggested that Narcissists were politically Conservative and rated themselves as attractive and optimistic. Psychopaths rated themselves as attractive but, rather surprisingly low on health and intelligence. Sadists, predominantly males, also rated themselves as attractive but were neither religious nor politically liberal: essentially politically conservative with little interest in religion.

Discussion

The results confirm, yet again, the four-factor structure of the SD4. The CFA provided evidence of the four-fold factor structure of the SD4. Comparing out CFA results with that of Paulhus et al (2020) we see striking similarities with ours providing a slightly better fit for the underlying model.

It is most interesting that the lowest correlation between the four factors was between Machiavellianism and Psychopathy. This is encouraging as many studies on the Dark Triad showed these two were often very highly correlated calling into question their conceptual overlap (Furnham et al., 2014).

Moreover, we found considerable and systematic evidence of sex differences which warrant explanation. Clearly males are more Narcissistic, Psychopathic and Sadistic (and Machiavellian) than females. Various authors have sought explanation for this in evolutionary psychology. Jonason et al, (2010) argued that DT characteristics like risk-taking, novelty-seeking, impulsivity, and having an aggressive nature facilitates a more exploitive social style which means that individuals can solve adaptive tasks like mating and extracting resources from one's environment more effectively. Clearly there are also downsides to extreme scores and behaviours associated with the DT, but these traits in moderation in males appears to convey certain advantages. Both extreme scorers in males and high scorers in females would be worth investigating

This study also revealed how DT people see themselves. Three of the four traits were associated with self-rated attractiveness, partly because of the confidence which comes from these traits. Surprisingly perhaps Psychopathy was rated with lower self-rated health and intelligence. It is interesting to note that both Narcissists and Sadists were politically conservative but only the former optimistic. The self-ratings and ideology showed a different pattern for the four dark traits which is a topic worthy of exploration. Interestingly neither self-rated EQ or health were related to any of the four dark traits.

Study 2: Correlates of the Dark Tetrad

In this study we compared three measures which overlapped: a 14-trait measure of the PDs; the SD4 as in the first study and a one item measure as a screening device for the PDs. One important issue in this area is whether the test is attempted to measure sub-clinical or clinical PDs. Thus,

some questionnaires measure dark traits and others the PDs seeing as one is sub-clinical (Dark Triad) and one is clinical (PDs). Those who develop these questionnaires are no doubt aware of whether they were developing a tool to be used to measure sub-clinical personality traits that exist in the general population or whether they were developing a diagnostic tool to be used by clinicians. The issue is not so much in the concept as the wording of the questions. Certainly, clinical tools have been used in general population studies even if the scores are assumed to be highly skewed.

In this study we use an instrument specifically aimed at measuring the PDs (the SCATI), but which has and can be used to measure subclinical traits in the normal population (Furnham & Grover, 2020). One question is whether it is acceptable and appropriate to use a sub-clinical personality measure in clinical diagnosis or a clinical measure to assess a PD in the normal population.

One dilemma facing a researcher in the dark-side area is choosing a measure. The first decision is which traits to measure: the triad, tetrad or all of the PDs? The next is whether to have comprehensive measures that even offer facets of each PD such as the new HDS which has 168 items and measures three facets for each of the eleven scales (i.e assesses 33 traits).Third, there is the ever-present issue concerning the psychometric properties of the scale.

There are many "housekeeping studies" which look at the correlation between self-report measures supposedly assessing the same variable (Furnham, 2008). The correlations are nearly always positive and significant, and much lower given the number of items in the scale: which may vary from 1 to 25. One other reason for lower correlations occurs if the variables measured has itself different facets and the two tests emphasize one facet over another. For instance, one measure of Narcissism my emphasize Grandiose and the other vulnerable Narcissism; while one measure

of Psychopathy might stress callous and unemotional behaviours and the other impulsivity. Interesting some questionnaires claim to be measuring Dark Traits and the others PDs.

This exploratory study sought to examine the overlap between the different measures. We hypothesised that the correlation between measures of the same construct (Narcissism, Psychopathy and Sadism) from the SDT3 and the SCATI would be r<.50. We also expected the four Dark Tetrad scales to correlate significantly positively with other Cluster B, or Moving Against Others classification of the PDs (Furnham, 2021) namely Histrionic and Schizotypal. Further we expected all four traits would be positively and significantly correlated with the simple totaled one-item measure of all the PDs.

Method

Participants

A total of 273 participants completed the questionnaire: 139 were men and 134 were women. They ranged in age from 18 to 64 years with the mean age was 30.1 years and SD= 7.93 years. All participants had at least a secondary school education and 37% were graduates. 46.4% of the sample had children.

Measures

1. *Short Dark Tetrad (as above).* We calculated the alphas in this study and they were *Crafty* (Machiavellianism) .63; *Special* (Narcissism) .65; *Wild* (Psychopath .62; *Mean* (Sadism) .76

2. *Coolidge Axis-II Inventory – Short Form (SCATI)* (Coolidge, 2001). The 70-item self-report measure assesses 14 personality disorders, 10 from *DSM-V*, 2 from Cluster B of the *DSM-IV-TR* (Depressive and Passive Aggressive) and 2 from *DSM-III-R* (Sadistic and Self-Defeating). The SCATI has good internal scale and test-retest reliability (Sinha & Watson, 2007). Each trait is measured by five items. It has been used to predict PDs in subclinical (Coolidge, Segal, Cahill &

Simenson, 2010) and clinical (Watson & Sinha, 1996) populations. The reliability of this measure in this study is as followed: Antisocial (.69), Avoidant (.79), Borderline (.72), Dependent (.75), Depressive (.81), Histrionic (.68), Narcissistic (.74), Obsessive-Compulsive (.61), Paranoid (.80), Passive-Aggressive (.75), Sadistic (.79), Self-defeating (.68), Schizotypal (.74), and Schizoid (.73).

3. *Structured Assessment of Personality Abbreviated Scale (SAPAS;* Lange et al, 2012). is a twelve-item screening interview for personality disorder. It has recently seen use on normal populations (Furnham et al., in press). Items were measured on a 9-point scale from Disagree to Agree (α= .775). A low score indicates the presence of a disorder.

Procedure

Ethical permission was sought and received from the relevant Ethics committee (CEHP/514/2017). The entire questionnaire was administered online. Participants were recruited via Amazon Mechanical Turk (MTurk), an online market for enlisting workers to participate in research. Data collected from MTurk has been found to have similar levels of reliability with traditional recruitment methodologies, and the sample's diversity was also found to be more superior to those of student samples (Buhrmester, Kwang, & Gosling, 2011). After data cleansing 6 participants were omitted from further analysis

Results

Table 3: Correlations between the three measures

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Machiavel.	41.56	9.42																		
2. Narcissism	28.16	10.41	.481**																	
3. Psychopathy	19.85	9.97	.337**	.472**																
4. Sadism	24.39	11.80	.425**	.360**	.597**															
5. Antisocial	8.02	2.55	.121	.113	.489**	.305**														
6. Avoidant	11.27	3.49	.051	-.205**	.142*	.132*	.305**													
7. Borderline	9.57	3.28	.144*	.067	.318**	.211**	.568**	.631**												
8. Dependent	8.72	2.65	.040	-.137*	.071	.021	.373**	.602**	.628**											
9. Depressive	11.80	3.69	.061	-.187**	.165*	.172*	.409**	.719**	.680**	.640**										
10. Histrionic	9.32	2.61	.229**	.471**	.364**	.251**	.475**	.129**	.401**	.239**	.251**									
11. Narcissistic	9.67	2.77	.308**	.518**	.392**	.412**	.382**	.205**	.334**	.215**	.186**	.610**								
12. Obsessive.	10.70	2.76	.202**	.193**	.220**	.106	.194**	.406**	.309**	.293**	.386**	.293**	.339**							
13. Paranoid	10.54	3.33	.305**	.062	.311**	.313**	.378**	.581**	.575**	.458**	.574**	.277**	.319**	.473**						
14. Passive.	10.32	2.84	.191**	.087	.362**	.295**	.549**	.578**	.563**	.449**	.568**	.381**	.448**	.450**	.656**					
15. Sadistic	6.53	1.99	.254**	.201**	.435**	.388**	.594**	.218**	.385**	.289**	.254**	.372**	.449**	.281**	.378**	.464**				
16. Self-Defeating	9.54	2.93	.130	-.072	.274**	.190**	.529**	.660**	.699**	.628**	.703**	.286**	.255**	.371**	.642**	.655**	.406**			
17. Schizotypal	8.51	2.83	.071	.079	.321**	.196**	.435**	.385**	.551**	.454**	.437**	.338**	.352**	.264**	.571**	.459**	.386**	.537**		
18. Schizoid	9.39	2.91	.099	-.147*	.238**	.215**	.370**	.523**	.457**	.409**	.582**	0.025	.105*	.297**	.547**	.489**	.312**	.586**	.375**	
19. SAPAS	12.42	1.54	-.132*	-.012	-.174**	-.127	-.364**	-.467**	-.455**	-.438**	-.559**	-.194**	-.174**	-.278**	-.391**	-.433**	-.268**	-.444**	-.308**	-.383**

N= 273 **p<.01   *p<.05

Correlations: Table 3 shows the correlations between the three measures. As with the first study the DT factors are positively intercorrelated: $.33<r<.57$. As for the "overlap" between the measures: SCATI and DT Narcissism was $r=.52$; Psychopathy $r=.49$ and Sadism $r=.40$. Looking at the significant correlations: DT Machiavellianism with seven (that is ½) SCATI traits ($r<.20$) especially Narcissism and Paranoia; Narcissism with eight SCATI traits, particularly Histrionic; Psychopathy with eleven SCATI traits, particularly Sadistic, Passive Aggressive and Histrionic; and Sadistic with twelve SCATI traits especially Narcissistic and Paranoid. Only five of the correlations were $r>.40$. Few of the correlations between the Dark Tetrad and Schizotypal were high three below $r=.30$. Indeed, the above were not Bonferonni corrected and when they were the correlations inevitably decreased.

Correlations between the DT and SAPAS scale were all $r<.20$. Six of the SAPAS scales showed correlations $r>.40$ but there was no clear pattern.

Three total scores were computed for the three measures: SCATI and SD4 $r=.34$; SCATI and SAPAS $r=-.54$; SCATI and SAPAS $r=-.14$.

Table 4: Regression of Tetrad on demography of Personality Disorders

	Machiavellianism				Narcissism				Psychopathy				Sadism			
	B	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*	*B*	*SE*	*Beta*	*t*
Sex	-3.505	1.221	-.186	-2.871**	-3.107	1.103	-.149	-2.816**	-2.078	1.165	-.104	-1.783	-6.943	1.346	-.295	-5.157**
Age	-.042	.052	-.057	-0.800	-.036	.047	-.045	-0.773	-.074	.050	-.095	-1.486	-.242	.057	-.263	-4.211**
Antisocial	-.232	.358	-.058	-0.648	-.228	.322	-.052	-0.709	1.132	.341	.269	3.315**	.087	.394	.018	0.222
Avoidant	-.320	.261	-.122	-1.228	-.603	.235	-.207	-2.564*	-.032	.249	-.012	-0.129	-.037	.288	-.011	-0.128
Borderline	.177	.316	.060	0.559	.397	.288	.121	1.378	.254	.302	.082	0.842	-.135	.349	-.037	-0.386
Dependent	-.076	.322	-.020	-0.236	-.377	.290	-.092	-1.299	-.714	.307	-.182	-2.322*	-.999	.355	-.215	-2.813**
Depressive	-.571	.295	-.224	-1.934	-.979	.267	-.348	-3.669**	-.671	.282	-.249	-2.381*	-.129	.326	-.041	-0.397
Histrionic	.383	.324	.100	1.181	1.376	.293	.327	4.691**	.374	.309	.093	1.210	.241	.357	.051	0.676
Narcissistic	.585	.272	.176	2.148**	1.225	.246	.334	4.984**	.456	.260	.130	1.756	.896	.300	.215	2.986**
Obsessive Comp.	.234	.255	.070	0.919	.676	.230	.183	2.941**	.104	.244	.029	0.429	-.322	.281	-.077	-1.143
Paranoid	1.260	.282	.447	4.470**	.580	.254	.186	2.282*	.349	.269	.117	1.295	.737	.311	.209	2.372*
Passive Aggressive	-.328	.331	-.096	-0.990	-.321	.302	-.084	-1.063	.102	.316	.028	0.323	-.079	.365	-.018	-0.216
Sadistic	.654	.419	.119	1.563	.057	.379	.009	0.152	.873	.400	.150	2.184*	1.644	.462	.239	3.563**
Self-Defeating	.207	.361	.064	0.574	-.118	.327	-.033	-0.361	.046	.345	.014	0.134	-.213	.398	-.053	-0.535
Schizotypal	-.595	.282	-.174	-2.108*	-.066	.255	-.017	-0.258	.196	.269	.054	0.728	.026	.311	.006	0.082
Schizoid	.191	.285	.060	0.671	.222	.260	.063	0.853	.569	.272	.169	2.091*	.855	.314	.215	2.722**
Adjusted R^2	.201				.466				.348				.37			

F	4.484	13.075	8.396	9.446
p	.000	.000	.000	.000

N=273, **p<.01 *p<05

Next a series of stepwise regressions were computed with age and sex in the first step and the 14 SCATI measures in the second step: the table shows the results of the third step. Four factors were significant in the regression of Machiavellianism which accounted for a fifth of the variance. Interestingly the most significant correlate was Paranoia. The second regression for Narcissism showed that nearly half of the variance was accounted for (48%). It indicated that Histrionic and Non-Depressive people tended to be "Special" in the terminology of DT. Just over a third of the variance (35%) was accounted for in the Psychopathy regression: Depressive and Dependent traits were negatively related to Psychopathy. Finally, the final regression indicated that Sadism was associated with being Narcissistic, Paranoid and Schizoid.

Table 4 also shows that four PDs from the SCATI namely Avoidant, Borderline, Passive-Aggressive and Self-Defeating were not associated with any of the four DT factors while Paranoid and Narcissism was associated with ¾ of the DT

Discussion

This paper looks at the relatively new concept and measure namely the Dark Tetrad which moves the Dark Triad on in three ways. First, the Dark Tetrad adds a dimension namely Sadism which has disappeared from much of the dark-side literature and does not appear in the Hogan Development Survey, or any DSM system for over 20 years. Second, it offers brief, face-valid items which seem not to suffer from a poor distribution which can be the case with other measures. Third, it offers a new way and terms in thinking about dark personalities such as calling Machiavellianism Crafty and Sadistic Mean. It is a short measure which could be administered along with a bright-side measure to see if it has incremental validity in predicting a wide range of meaningful beliefs and behaviours (Furnham, 2021).

This study showed a modest overlap between measures of the same variable, namely the four item SCATI scales and the eight-item SD4 scales. The correlations were in the $.40 < r < .50$ range with Narcissism being the Highest and Sadism the lowest. Interestingly the Histrionic, Narcissistic and Sadistic scale of the SCATI correlated significantly positively with each of the four Tetrad scales. These results are similar to those when tests of "identical" concepts are compared (Furnham, 2008). However, they do partly explain why results using different tests are not replicable. The question remains as to whether different tests of the same concept may be tapping into rather different facets of that concept, particularly if they are short like the SCATI. Thus one assessing psychopathy may concentrate on callousness, another on remorseless and a third on unemotionality.

To understand these results, it is perhaps best to compare the four items from the SCATI measure of Sadism . "I have been cruel or violent to show I am in charge in a relationship"; "I would humiliate or put-down someone in public if I felt they deserved it". "I have used harsh treatment or severe discipline to control someone in my care". "The suffering of humans or animals amuses me". "I have told lies to harm or inflict pain on others". These items may explain why the SCATI Sadism measure correlates more highly with the SD4 Psychoticism measure than the SD4 Sadism tests (r=.44 vs .39). Indeed, this may explain why the correlations between all the 14 SCATI scales which the exception of Depressive and Dependent are correlated with the DT. Some of the SCATI Sadism items seem "saturated" with psychopathy. The art of "item writing" is indeed important.

This speaks to the sensitive issue of the measurement of a trait vs a disorder. Thus, to compare items from the Dark Triad and the Dark Tetrad measuring Narcissism vs those similar self-report measures like the SCATI or the well-known Narcissistic Personality Inventory (NPI) now over 40 years old and still used extensively (Raskin & Hall, 1981). Raskin and Terry (1988) further developed the NPI, producing the NPI-40, which has seven dimensions: authority, exhibitionism, superiority, vanity, exploitativeness, entitlement, and self-sufficiency—all of which were found to have internal

consistency levels no lower than .50. It does seem clear that PD measures do look at more extreme, unadaptive and pathological behaviours which indeed characterise the PDs. In this sense even a high score on a DT measure is probably not picking up a PD. This conceptual overlap between DT and PD researchers is however one of sensitivity.

These studies give support to the SD4 though it is uncertain whether it helps the debate about Sadism in the DSM system. The important question is whether the fourth facet of Sadism is an improvement over the three dark triad measures: that is whether Sadism accounts for unique and explicable incremental variance over the dark side measures. It is not clear whether the huge increase in papers concerning the Dark Triad will be matched by those interested in the Dark Tetrad.

Like all others this study had limitations. First, the second study had a modest and unrepresentative sample size. It would be desirable to replicate this study on a much larger sample. Further, the data was restricted to self-report where there are issues of socially desirable responding and the results being inflated because of method invariance. Third, the alpha for the Machiavellian scale was below the usual cut off of .70 in the first study and three were below that number in the second study. It remains to be seen whether interest in the Dark Tetrad will match that of the Dark Triad.

References

Andersen, N., Jonason, P., & Furnham, A. (2021). *Bibliometric Analysis of the Dark Triad: The Status of a Rapidly Developing Research Area.* Manuscript under review

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2015). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Blötner, C., Ziegler, M., Wehner, C., Back, M., & Grosz, M. (2021). The Nomological Network of the Short Dark Tetrad Scale (SD4). https://doi.org/10.31234/osf.io/js5qz

Buhrmester, M., Kwang, T., & Gosling, S. D. (2016). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality data? *Perspectives on Psychological Science, 6(1),* 3-5. https://doi.org/10.11771/1745691610393980

Buckels, E. E. , Trapnell, P. D. , Andjelovic, T. , & Paulhus, D. L. (2018). Internet trolling and everyday sadism: Parallel effects on pain perception and moral judgement. *Journal of Personality* , *87* (2), 328–340. doi:10.1111/jopy.12393

Buckels, E. E. , Trapnell, P. D. , & Paulhus, D. L. (2014). Trolls just want to have fun. *Personality and Individual Differences* , *67* , 97–102. doi:10.1016/j.paid.2014.01.016

Chabrol, H., Bouvet, R., & Goutaudier, N. (2017). The Dark Tetrad and antisocial behavior in a community sample of college students. *Journal of Forensic Psychology Research and Practice, 17*(5), 295–304. https://doi.org/10.1080/24732850.2017.1361310

Chabrol, H., Van Leeuwen, N., Rodgers, R., & Sejourne, N. (2009). Contributions of psychopathic, narcissistic, Machiavellian, and sadistic personality traits to juvenile delinquency. *Personality and Individual Differences, 47(7),* 734–739. doi:10.1016/j.paid.2009.06.020

Chabrol, H., Melioli, T., Van Leeuwen, N., Rodgers, R. & Goutaudier, N. (2015). The Dark Tetrad: Identifying personality profiles in high-school students. *Personality and Individual Differences, 83*, 97–101.

Cawood, C. D., & Huprich, S. K. (2011). Late Adolescent Nonsuicidal Self-Injury: The Roles of Coping Style, Self-Esteem, and Personality Pathology. *Journal of Personality Disorders, 25(6),*765-781. https://doi.org/10.1521/pedi.2011.25.6.765

Coolidge, F. (2001). *Short form of the Coolidge Axis-II inventory (SCATI): Manual*. Psychology Department, University of Colorado.

Coolidge, F. L., Segal, D. L., Cahill, B. S., & Simenson, J. T. (2010). Psychometric properties of a brief inventory for the screening of personality disorders: The SCATI. *Psychology and Psychotherapy: Theory, Research and Practice*, *83*(4), 395– 405. https://doi-org /10.1348/147608310X486363

Davison, M., & Furnham, A. (2018). The personality disorder profile of professional actors. *Psychology of Popular Media Culture, 7,* 33–46.

Dinić, B.M., & Jevremov, T. (2019) Trends in research related to the Dark Triad: A bibliometric analysis. *Current Psychol*ogy, https://doi.org/10.1007/s12144-019-00250-9

Dinić, B.M., Allred,T., Petrović, M., & Wertag. A. (2020). A Test of Three Sadism Measures. *Journal of Individual Differences*, 41:4 219-227.

Forero, C. G., Maydeu-Olivares, A., & Gallardo-Pujol, D. (2009). Factor analysis with ordinal indicators: A Monte Carlo study comparing DWLS and ULS estimation. *Structural Equation Modeling, 16*(4), 625-641. https://doi.org/10.1080/10705510903203573

Foulkes, L. (2019). Sadism: Review of an elusive construct. *Personality and Individual Differences*, *151*, 109500. https://doi.org/10.1016/j.paid.2019.07.010 C̲

Furnham, A. (2008). Relationship among Four Big Five Measures of Different Length. *Psychological Reports,* 102 (1): 312–316.10.2466/pr0.102.1.312-316

Furnham, A. (2020). The Personality Disorders and Money Beliefs and Behaviours. *Financial Planning Review,*

Furnham, A. (2021). The Bright and Dark Side of Personality: The relationship between Personality Traits and Personality Disorders. In: Lusk, D. & Hayes, T. (Eds). *The Good, the Bad, and the Human Dark Side at Work*: New York: SIOP.

Furnham, A., & Grover, S. (2020). Correlates of self-estimated intelligence. *Journal of Intelligence. 8, 6.*

Furnham, A., & Trickey, G. (2011). Sex differences in the dark side traits. *Personality and Individual Differences, 50*(4), 517- 522.   https://doi.org/10.1016/j.paid.2010.11.021

Furnham, A., Milner, R., Akhtar, R., & De Fruyt, F. (2014). A review of the measures designed to assess DSM-5 personality disorders. *Psychology*, *5*(14), 1646-1685.

Furnham, A., Richards, S. C., & Paulhus, D. L. (2013). The dark triad of personality: A 10-year review. *Social and Personality Compass, 7*, 199–216.

Furnham, A., Richards, S., Rangle, L., & Jones, D. (2014). Measuring malevolence: Quantitative issues surrounding the dark triad of personality. *Personality and Individual Differences, 67,* 114–121.

Furnham. A., Horne, G., & Grover S (2020). Correlates of the Militant Extremist Mindset. *Frontiers in Psychology.* 11:2250. doi: 10.3389/fpsyg.2020.02250

Grover, S. (2018). *The Upside to the Dark Side: An empirical investigation into the moderators and mediators of the Dark Triad and work-related outcomes* (Unpublished doctoral dissertation). University College London.

Hogan, R., & Hogan, J. (1997). *Hogan Development Survey Manual.* Tulsa, OK: HAS.

Hogan, R., Raskin, R., & Fazzini, D. (1990). The dark side of charisma. In K.E. Clark & M.B. Clark (Eds.), *Measures of Leadership.* Greensboro, NC: Center for Creative Leadership. Pp. 343-354.

Holgado–Tello, F. P., Chacón–Moscoso, S., Barbero–García, I., & Vila–Abad, E. (2010). Polychoric versus Pearson correlations in exploratory and confirmatory factor analysis of ordinal variables. *Quality & Quantity, 44*(1), 153-166. https://doi.org/10.1007/s11135-008-9190-y

Hughes, S., & Samuels, H. (2020). Dark desires: The Dark Tetrad and relationship control. *Personality and Individual Differences, 170,* 110548,

Huprich, S. K. (Ed.). (2015). *Personality Disorders: Toward theoretical and empirical integration in diagnosis and assessment.* Washington, DC: American Psychological Association.

Johnson, L. K., Plouffe, R. A., & Saklofske, D. H. (2019). Subclinical sadism and the dark triad: Should there be a Dark Tetrad? *Journal of Individual Differences, 40*(3), 127–133. https://doi.org/10.1027/1614-0001/a000284

Jonason, P.K.., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. *Psychological Assessment. 22 (2): 420–432. doi:10.1037/a0019265. ISSN 1939-134X. PMID 20528068*

Jonason, P. K., Li, N. P., & Teicher, E. A. (2010). Who is James Bond?: The dark triad as an agentic social style. *Individual Differences Research*, *8*(2), 111–120.

Jonason, P. K., & Davis, M. D. (2018). A gender role view of the Dark Triad traits. *Personality and Individual Differences, 125,* 102–105. https://doi.org/10.1016/j.paid.2018.01.004

Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The Dark Triad: Facilitating a short-term mating strategy in men. *European Journal of Personality*, *23*(1), 5–18. https://doi.org/10.1002/per.698

Jonason, P. K., Lyons, M., & Blanchard, A. (2015). Birds of a "bad" feather flock together: The Dark Triad and mate choice. *Personality and Individual Differences*, *78*, 34–38. https://doi.org/10.1016/j.paid.2015.01.018

Jonason, P. K., Slomski, S., & Partyka, J. (2012). The Dark Triad at work: How toxic employees get their way. *Personality and Individual Differences*, *52*(3), 449–453. https://doi.org/10.1016/j.paid.2011.11.008

Jonason, P. K., Underhill, D., & Navarrate, C. D. (2020). Understanding prejudice in terms of approach tendencies: The Dark Triad traits, sex differences, and political personality traits. *Personality and Individual Differences*, *153*, 109617.

Jones, D.N. & Paulhus, D.L. (2014). Introducing the short dark triad (SD3): A brief measure of dark personality trait. *Assessment, 21(1),* 28–41.

Kay, C. (2021) Actors of the most fiendish character: Explaining the associations between the Dark Tetrad and conspiracist ideation*, Personality and Individual Differences, 171*, 110543,

Koehn, M. A., Okan, C., & Jonason, P. K. (2019). A primer on the Dark Triad traits. *Australian Journal of Psychology*, *71*(1), 7–15. https://doi.org/10.1111/ajpy.12198

Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2019). *Multivariate Normality Tests*. https://cran.r-project.org/web//packages/MVN/MVN.pdf

Kowalski, C., Di Pierro, R., Plouffe, R., Rogoza, R., & Saklofske, D. (2019). Enthusiastic Acts of Evil: The Assessment of Sadistic Personality in Polish and Italian Populations. *Journal of Personality Assessment. 1673760*

Lange, J., Geiser, C., Wiedl, K. H., & Schöttke, H. (2012). Screening for personality disorders: A new questionnaire and its validation using Latent Class Analysis. *Psychological Test and Assessment Modelling, 54*(4), 323–342

Međedović, J., & Petrović, B. (2018). The Dark Tetrad: Structural properties and location in the personality space. *Journal of Individual Differences, 36,* 228–236. https://doi.org/10.1027/ 1614-0001/a000179

Muris, P., Merckelbach, H., Otgaar, H., & Meijer, E. (2017). The Malevolent Side of Human Nature: A Meta-Analysis and Critical Review of the Literature on the Dark Triad (Narcissism, Machiavellianism, and Psychopathy). *Perspectives on Psychological Science*, *12*(2), 183–204. https://doi.org/10.1177/1745691616666070

Myers, W.C., Burket, R.C., & Husted, D.S. (2006). Sadistic personality disorder and comorbid mental illness in adolescent psychiatric inpatients. *Journal of the American Academy of Psychiatry and the Law Online*, 34 (1), 61–71.

Neumann, C., Jones, D., & Paulhus, D. (2021). *Examining the Short Dark Tetrad (SD4) across Models, Correlates, and Gender.* Manuscript under review

Pajevic, M., Vukosavljevic-Gvozden, T., Stevanovic, N., & Neumann, C. S. (2018). The relationship between the Dark Tetrad and a two-dimensional view of empathy. *Personality and Individual Differences, 123,* 125–130. https://doi.org/10.1016/ j.paid.2017.11.00

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality, 36*(6), 556–563.

Paulhus, D.L., Buckels, E.E., Trapnell, P.D., & Jones, D.N. (2020). Screening for dark personalities: The Short Dark Tetrad (SD4). *European Journal of Psychological Assessment* https://doi.org/10.31234/osf.io/2rz3q

Paulhus, D., Gupta, R., & Jones, D. (2021). Dark or Disturbed? Predicting Aggression from the Dark Tetrad and Schizotypy. *Aggressive Behaviour. Under review*

Paulhus, D. L., & Dutton, D. G. (2016). Everyday sadism. In V. ZeiglerHill & D. K. Marcus (Eds.), *The dark side of personality: Science and practice in social, personality, and clinical psychology* (p. 109–120). American Psychological Association.

Raskin, R., & Hall, C. S. (1981). The Narcissistic Personality Inventory: Alternative Form Reliability and Further Evidence of Construct Validity. *Journal of Personality Assessment, 45*, 159-162. http://dx.doi.org/10.1207/s15327752jpa4502_10

Raskin, R. & Terry, H. (1988). A Principal-Component Analysis of the Narcissistic Personality Inventory and Further Evidence of Its Construct Validity. *Journal of Personality and Social Psychology, 54*, 890-902. http://dx.doi.org/10.1037/0022-3514.54.5.890

Sedikides, C., Rudich, E., Gregg, A., Kumashiro, M., & Rusbult, C. (2004) Are normal narcissists psychologically healthy? Self-esteem matters. *Journal of Personality and Social Psychology, 87*(3), 400-416. http://doi.org/10.1037/0022-3514.87.3.400

Sinha, B. K., & Watson, D. C. (2007). Stress, coping and psychological illness: A cross-cultural study. *International Journal of Stress Management, 14*(4), 386–397. https://doi-org.ezproxy1.bath.ac.uk/10.1037/1072-5245.14.4.386

Tyrer, P., Mulder, R., Crawford, M., Newton-Howes, G., Simonsen, E., Ndetei, D., Koldobsky, N., Fossati, A., Mbatia, J., & Barrett, B. (2010). Personality disorder: a new global perspective. *World Psychiatry. 9*(1), 56–60. https://doi.org/10.1002/j.2051-5545.2010.tb00270.x

Tyrer, P. (2020). Why we need to take personality disorder out of the doghouse, *British Journal of Psychiatry, 216*(2), 65-66. https://doi-org/10.1192/bjp.2019.125

Watson, D. C., & Sinha, B. K. (1996). A normative study of the Coolidge Axis II Inventory. *Journal of Clinical Psychology, 52*(6), 631-637. https://doi-org/10.1002/(SICI)1097-4679(199611)52:6<631::AID-JCLP5>3.0.CO;2-N

Webster, G., & Wongsomboon, V. (2020).*The Hateful Eight (H8): An Efficient Multifaceted Approach to the Short Dark Tetrad (SD4).* Under review.