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The Dark Triad and the seven deadly sins

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ABSTRACT

The present study reports on the development and validation of the Vices and Virtues Scales (VAVS), which assesses individual differences in the propensity to engage in the seven deadly sins. Item-level analyses, exploratory factor analysis, and confirmatory factor analysis were conducted on two independent samples of adults. Results indicated that all items composing the scale are psychometrically sound, and some evidence was found in support of the measure's seven-factor structure. Further analyses of the VAVS subscales and the Dark Triad traits revealed significant positive correlations between nearly all traits assessed. Implications of these findings for the Dark Triad cluster and the overall comprehensiveness of contemporary personality frameworks are discussed.

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1. Introduction

Recently, there has been growing interest in subclinical forms of socially aversive behavior. A frontrunner in this research has been the Dark Triad, composing Machiavellianism, narcissism, and psychopathy (Paulhus & Williams, 2002). In addition to offering a novel avenue of research, the Dark Triad has played a role in challenging the comprehensiveness of the Five Factor model (FFM)—the conventional framework of personality (Costa & McCrae, 1992). Although the Dark Triad traits exhibit some significant correlations with the FFM (e.g., Vernon, Villani, Vickers, & Harris, 2008), they demonstrate stronger and ultimately more compelling associations with personality variables not currently incorporated within the model. These variables include the Honesty-Humility factor of the HEXACO model (Ashton et al., 2004), as well as most of the ten traits assessed by the Supernumerary Personality Inventory (SPI; Paunonen & Jackson, 2000), many of which are, themselves, in line with contemporary definitions of socially malevolent behavior (e.g., Veselka, Schermer, & Vernon, 2011). These results support the suggestion that the FFM may not be able to account for the full range of individual differences that exist, particularly those that are antisocial in nature, and encourages further identification of sub-clinical antisocial traits that may be untapped by existing frameworks.

A promising candidate to consider in these future investigations is the collection of the capital vices, also known as the seven deadly

or cardinal sins. This group of constructs represents a list of self-destructive and other-destructive behaviours, as originally defined by the Catholic Church, and subsequently echoed in philosophical, scientific, and sociopolitical texts (e.g., Kristjánsson, 2013; Medina, 2000; Schimmel, 1997). Specifically, the capital vices (with their contrarian virtues) include: anger (patience), envy (kindness), gluttony (temperance), greed (charity), lust (chastity), pride (humility), and sloth (diligence). The inclusion of the virtues in considerations of the vices reflects both the Catholic notion that a lack of vice implies the presence of virtue (Bejczy, 2011), as well as the psychometric idea that personality traits are bipolar—defined by a positive pole, a negative pole, and a neutral point (Paunonen & Hong, in press). Given the relevance of the notion of sin to the sub-clinical realm of human functioning, studying these constructs in conjunction with the Dark Triad may be fruitful in assessments of personality models.

2. Deadly sins: defining features and correlates

Given that no valid measure of the sins has yet been developed, despite previous efforts to study the constructs (Backus, 1969; Capps, 1989; Nauta & Derckx, 2007), direct empirical assessments of these traits in conjunction with existing personality variables have not been conducted. However, a preliminary understanding of these constructs and their potential relations with other measures is possible if one examines research pertaining to each vice separately.

2.1. Anger

Anger is characterized by uncontrollable feelings of frustration, expressed internally in the form of vengeful thoughts, or outwardly

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as physical assault or verbal aggression (Lyman, 1989). In empirical investigations of related constructs, relevant traits have been linked to low Agreeableness in the FFM (Tremblay & Ewart, 2005), and to numerous traits characteristic of the SPI (e.g., Reidy, Zeichner, Foster, & Martinez, 2008; Zuckerman & Kuhlman, 2000). These patterns of correlations reflect those exhibited by Dark Triad traits (Veselka et al., 2011). Some anger-related traits have also shown relations with Machiavellianism (Russell, 1974), narcissism (Vazire & Funder, 2006), and psychopathy (Falkenbach, Poythress, & Creevy, 2008).

2.2. Envy

Envy is defined by an overwhelming sense of resentment, where individuals wish for others to be deprived of the things that they themselves lack (Lyman, 1989). The few empirical investigations of envy that have been conducted have noted that the trait appears to be unrelated to the FFM (Wade & Walsch, 2008), suggesting that it exists beyond the traditional personality framework. In support of this suggestion, an inverse relation has been reported between jealousy and humility (Richards, 1992)—a variable characteristic of the Honesty-Humility HEXACO dimension that is not presently captured by the FFM. Relations have also been noted between envy and the traits of Machiavellianism (Vecchio, 2000) and narcissism (Morris, Brotheridge, & Urbanski, 2005).

2.3. Gluttony

Gluttony is characterized by overconsumption and overindulgence in the realms of food, alcohol, and drugs, as well as by extravagant spending (Miller, 1997). Traits relevant to this definition of gluttony have shown weak to non-existent associations with the FFM dimensions, but they have been linked to the negative pole of HEXACO's Honesty-Humility factor (Weller & Tikir, 2011). In previous work, the Dark Triad traits have also exhibited associations with overconsumption and materialism (Lee et al., 2012).

2.4. Greed

Greed comprises a tendency to manipulate and betray others for personal gain (Capps, 1989). Consequently, this vice strongly reflects the Machiavellianism factor of the Dark Triad (Christie & Geis, 1970). As previously noted, Machiavellianism has exhibited correlations with traits existing outside of the FFM (Veselka et al., 2011), as well as with the remaining two Dark Triad constructs of narcissism and psychopathy (Paulhus & Williams, 2002).

2.5. Lust

Lust is characterized by overwhelming thoughts of a sexual nature and is often linked to promiscuity (e.g., Dodge, Reece, Cole, & Sandfort, 2004). Sexual promiscuity has been shown to exhibit low but significant correlations with nearly all dimensions of the FFM (Schmitt, 2004), but also with the SPI traits of risk-taking and low-religiosity (e.g., Ahrold, Farmer, Trapnell, & Meston, 2011). Seductiveness, reflecting charming and flirtatious behaviours intended to attract the sexual interests of others, has correlated significantly with all Dark Triad traits (Veselka et al., 2011).

2.6. Pride

Pride entails excessive self-love, paired with a disregard for the efforts of others (Kaplan & Schwartz, 2008). As such, this construct closely resembles the Dark Triad's narcissistic trait (Raskin & Hall, 1979). As previously noted, narcissism has exhibited significant associations with variables that fall beyond the FFM (Veselka

et al., 2011), as well as with the other traits of the Dark Triad (Paulhus & Williams, 2002).

2.7. Sloth

Sloth is characterized by lack of motivation and unwillingness to utilize fully one's skills (Lyman, 1989). Studies of diligence and ambition—tendencies defining the negative pole of the sloth construct—have found that these traits are incorporated readily into both the FFM and HEXACO models (e.g., Barrick & Mount, 1991; Lee, Ogunfowora, & Ashton, 2005). Investigations of the Dark Triad, however, have reported both positive and negative associations between ambitious or motivated behaviour and the Dark Triad traits, with associations varying on the basis of culture and context (e.g., O'Boyle Jr., Forsyth, Banks, & McDaniel, 2012; Zettler & Solga, *in press*).

3. Present study

Given the growing body of research on socially malevolent variables, and the mounting evidence in support of the proposition that the FFM cannot account for the intricacies of these variables, it appears fruitful to explore traits that have been overlooked in previous assessments of antisocial constructs. Specifically, in this study, we aim to develop and validate a measure of the vices, known as the Vices and Virtues Scale (VAVS). To ensure that, in developing the measure, we are tapping into a sampling space presently occupied by the Dark Triad, we also aim to examine the relations between each of the Dark Triad variables and the sins. In light of the numerous common correlates shared by the Dark Triad and sin constructs, and the evidence suggesting that the sins may not be captured fully by the FFM, it is predicted that significant, positive associations will be observed between all variables measured.

4. Study 1

The purpose of the first study was to develop a measure of the vices and their opposing virtues. To ensure that all subsequent research pertaining to these constructs would stem from sound measurement, the employed validation process was modeled after existing psychometric literature on questionnaire development (e.g., Holden & Fekken, 1985).

4.1. Method

4.1.1. Participants

Participants in the study were 1,507 adults from North America (493 males, 1,011 females). They ranged in age from 18 to 79 years ($M = 22.87$; $SD = 7.02$). Participants were recruited from an undergraduate participant pool, as well as through posters and recruitment messages on social media websites. Participants completed the study individually online.

4.1.2. Measures and procedure

The VAVS was created for the purpose of the present study to assess individual differences in the sins. Based on existing literature relevant to the sins, the authors wrote detailed descriptions of each vice and virtue, and developed behavioural exemplars to illustrate the positive and negative pole of the constructs (Paunonen & Hong, *in press*). In accordance with these specifications, the authors generated an initial set of 175 items. This set was reduced to 132 items after omitting items that were deemed ambiguous, poorly worded, or descriptive of multiple vices by the authors as well as by experts in test construction who were provided with

the subscale descriptions. The items were assessed on a 5-point Likert scale (1 = *disagree strongly*, 5 = *agree strongly*), where higher scores reflect a greater endorsement of a given vice.

Further, participants also completed the Marlowe–Crowne Social Desirability Scale (MCSD; Crowne & Marlowe, 1960) assessing individual differences in socially desirable responding. This scale is made up of 33 true–false items pertaining to everyday behaviors. It is psychometrically sound (e.g., Barger, 2002) and yielded a Cronbach's alpha of .78 in the current study.

Participants were directed to the questionnaires online via a link provided in all recruitment media. Upon accessing the link, they were shown a letter of information outlining the study. Those willing to participate were asked to indicate their agreement to do so via an online consent form. After informed consent was obtained, participants were presented with the measures, with the items presented in a random order. Upon completing the measures, participants were debriefed.

4.2. Results

4.2.1. Item-level analyses

The standard deviation of each item was assessed to ensure sufficient variability. Items showing low variability ($SD < 1.0$) were interpreted as reflecting behaviors that were either too common or too uncommon, and were therefore considered for deletion (e.g., Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003). Item-total correlations were obtained between each item and total scores on the VAVS. To correct for inflation of the correlation coefficient, the total item value was calculated without the inclusion of the item of interest (Henrysson, 1963). Any item showing a low corrected item-total correlation smaller than .20 was considered for deletion from the scale to ensure overall measure homogeneity (e.g., Rief & Hiller, 1999). To reduce substantial overlap between the subscales, correlations were computed between each item and its own subscale, as well as between each item and the total score of the remaining six subscales. Items whose correlations with the other six subscales was .20 or greater than its correlation with its own subscale were considered for deletion (Martin et al., 2003). Similarly, to reduce the effect of social desirability, items whose absolute correlation with the MCSD total score were .20 or greater than their correlations with their own subscale were flagged for deletion (Martin et al., 2003). Lastly, to ensure internal consistency for each subscale, items were considered for deletion if they exhibited low loadings ($< .30$) on their corresponding subscale following principal axis factoring (Hinkin, 1998). Following these analyses, the VAVS measure was reduced to 80 items, with 12 items defining each subscale, with the exception of Envy, which only had 8 items. Descriptive statistics as well as Cronbach's alpha values for each VAVS subscale following item-level analysis can be seen in Table 1.

4.2.2. Exploratory factor analysis (EFA)

EFA using principal axis factoring was conducted to examine the structure of the VAVS (Hinkin, 1998). Results revealed that there were nine factors with an eigenvalue greater than 1. The scree plot, however, indicated that fewer factors would produce a more parsimonious solution, elbowing at factors 5 and 8. Follow-up EFA analyses using the software *Mplus* (Muthén & Muthén, 2012) revealed good model fit for the seven-factor solution (RMSEA = .05; SRMR = .05; CFI = 82; TLI = 85). Fewer factors failed to yield better fit. Consequently, a seven-factor structure was extracted. Oblique rotation was selected to reflect the correlated nature of the subscales. The factor loadings, however, did not clearly delineate between the seven sin constructs. Specifically, the first factor was defined predominantly by Greed and Pride, the second by Lust, the third by Sloth, the fourth by Anger and

Table 1

Descriptive and reliability statistics for the vices and virtues scale (VAVS) at two stages of item-level analysis.

	Mean	Standard deviation	Cronbach's α
<i>Study 1</i>			
Anger	2.54	.45	.80
Envy	2.65	.46	.73
Gluttony	2.58	.50	.77
Greed	2.58	.42	.72
Lust	2.73	.56	.82
Pride	2.58	.42	.75
Sloth	2.41	.44	.79
<i>Study 2</i>			
Anger	2.58	.65	.78
Envy	2.61	.71	.87
Gluttony	2.14	.71	.81
Greed	2.67	.69	.82
Lust	2.46	.66	.79
Pride	2.34	.57	.77
Sloth	2.56	.61	.75

Envy, and the sixth and seventh by Gluttony. The fifth factor did not exhibit particularly high loadings from the items assessed.

4.3. Discussion

Following item-level analyses, the VAVS was reduced to 80 items, all of which demonstrated adequate psychometric properties. The results of the EFA revealed that, for nearly all of the revised subscales, the items composing these subscales tended to load in the same pattern on predominantly one factor, suggesting acceptable unidimensionality (Gerbing & Anderson, 1988). The exception to this general trend, however, was Gluttony, whose items loaded on two separate factors relatively evenly, indicating that the subscale may be tapping into two unique aspects of the vice. Additionally, results revealed that Greed and Pride as well as Anger and Envy were too highly intercorrelated, as made evident by their items loading on a single common factor. In examining the items of these scales, it was evident that the Envy items were heavily defined by tendencies toward frustration, whereas both Greed and Pride were characterized by entitlement. In order to yield more distinct subscales, therefore, additional item revision was necessary at this stage, particularly for the scales of Envy, Greed, Pride, and Gluttony.

5. Study 2

The goal of the second study was to further refine the items of the VAVS in order to yield a more psychometrically sound measure, and to confirm the intended seven-factor structure of the scale. Furthermore, as a means of assessing convergent validity, correlations with the Dark Triad were also assessed.

5.1. Method

5.1.1. Participants

A total of 253 adults from North America took part in the second study (58 males, 195 females). Participants were between the ages of 18 and 47 ($M = 21.99$; $SD = 5.06$). Participants were recruited from an undergraduate participant pool, and they completed all measures individually and online.

5.1.2. Measures and procedure

The revised version of the VAVS employed in the current study comprised 108 items—80 items retained from study 1, as well as 28 new items written for the subscales of Envy, Greed, Pride, Glut-

tony, and Sloth. A 5-point Likert scale was paired with the items (1 = *disagree strongly*, 5 = *agree strongly*).

In addition, the Short Dark Triad (SD3; Jones & Paulhus, in press), a 27-item measure assessing individual differences in the Dark Triad traits, was administered. It presents participants with self-reflective statements, to which they respond on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Jones and Paulhus reported adequate psychometric properties for the SD3. Similarly, the present study found the SD3 to be a reliable measure, yielding alpha reliabilities of .71, .72, and .78 for Machiavellianism, narcissism, and psychopathy, respectively.

To account for socially desirable responding, the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1991) was also employed. This measure presents participants with 40 items, to which they respond using a 7-point Likert scale (1 = *not true*, 5 = *very true*). Higher scores reflect a greater tendency to provide exaggeratedly desirable responses. The BIDR is a psychometrically sound assessment tool that yielded a Cronbach's alpha of .80 in the current study.

The same procedure used in the first study was applied to this second investigation.

5.2. Results

5.2.1. Item-level analyses

A second wave of item-level analysis was carried out to examine the properties of the new items VAVS items, and to ensure that the retained items from the initial version continued to meet psychometric criteria. As in the first study, items needed to show sufficient variability ($SD > 1.0$), and adequately large corrected item-total correlations with the overall VAVS scale ($r > .20$) in order to be retained. Additionally, items whose correlation with the other six subscales or with total BIDR were .20 or greater than their correlation with their own subscale were deleted. Of the remaining valid items, only the ten best items from each scale were retained, yielding a final 70-item scale. Descriptive statistics as well as Cronbach's alpha values for each subscale following this stage of item-level analysis can be seen in Table 1.

5.2.2. Confirmatory factor analysis (CFA)

CFA was carried out using *Mplus* to assess whether the 70-item VAVS could produce a seven-factor structure reflecting the seven sins. Given that the data were examined at the item-level, where scores reflected categorical values, all CFAs were conducted using the mean and variance-adjusted weighted least squares estimator (WLSMV). This estimator has been shown to be robust for sample sizes exceeding 200 participants in both normal and non-normal distributions (Beauducel & Herzberg, 2006; Flora & Curran,

2004). The specified measurement model comprised seven latent factors, reflecting the seven vices, each with ten indicators. All indicators exhibited moderate to high significant loadings on their corresponding factors. Model fit results indicated good or nearly good model fit (RMSEA = .04; CFI = .84; TLI = .83). Additional modifications were assessed, including the specification of a single latent sin factor, as well as a higher-order structure depicting the seven latent sin dimensions loading onto a vice super-factor. All tested models exhibited poorer model fit in comparison to the first measurement model.

5.2.3. Correlations between the dark triad and the deadly sins

Bivariate correlations were examined between the subscales of the VAVS and the Dark Triad traits (see Table 2). The correlations among the VAVS subscales as well as among the Dark Triad constructs were significant and positive. When correlations between the Dark Triad traits and the VAVS variables were assessed, all associations were significant and positive, with the exception of that between narcissism and the Sloth subscale, which was non-significant. Strong correlations were evident between Machiavellianism and the deadly sins of Greed and Pride; between narcissism and Pride; and between psychopathy and the vices of Greed, Lust, and Pride.

6. Discussion

Overall, the VAVS appears to provide reliable assessment of the deadly sins. Each item met the psychometric criteria set out in the study. Furthermore, all subscales showed significant positive associations, suggesting that they may occupy a similar realm of personality. The seven-factor structure of the measure received mixed support through CFA. However, given that it has been shown that fit indices may be affected by sample size (Marsh, Balla, & McDonald, 1988), with larger sample sizes yielding better fit, it is quite possible that the addition of more participants to the present study would have allowed for greater consensus among the fit indices.

In line with our predictions, significant positive correlations were observed between the deadly sins and the Dark Triad traits in all cases but one. These correlations were predominantly moderate to high, suggesting that the Dark Triad and VAVS variables are closely related, and appear to be capturing individual differences in antisocial behaviors. Furthermore, these correlations suggest that, like the Dark Triad, the VAVS variables may also exist outside of the FFM (Veselka, Schermer, & Vernon, 2012).

Particularly strong associations were seen between all of the Dark Triad traits and the sins of Greed and Pride. In its defining features, Greed is reminiscent of Machiavellianism, and Pride

Table 2
Pearson correlation between the subscales of the vices and virtues scale (VAVS) and the SD3.

	1	2	3	4	5	6	7	8	9	10
VAVS										
(1) Anger		.54**								
(2) Envy			.35**							
(3) Gluttony				.60**						
(4) Greed					.53**					
(5) Lust						.42**				
(6) Pride							.42**			
(7) Sloth								.17**		
SD3										
(8) Machiavellianism									.45**	
(9) Narcissism										.57**
(10) Psychopathy										.38**

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

resembles narcissism. The fact that correlations between these similar traits were observed reveals that the operationalizations of Pride and Greed in the VAVS is in line with how relevant variables have been represented. That being said, correlations between the traits did not suggest redundancy. Specifically, Greed is defined by manipulative tendencies that characterize Machiavellianism, but it also comprises the hoarding of goods (Capps, 1989). For Pride, the construct is defined solely by the antisocial elements of vanity, and does not include the prosocial tendencies that are tapped by contemporary narcissism measures (Watson & Morris, 1991).

In our study, Lust correlated highest with psychopathy. This finding is in line with previous investigations, which have found that individuals scoring high on psychopathy tend to exhibit notably high levels of infidelity (Jones & Weiser, 2014). Such individuals also show a heightened propensity to employ an exploitative, short-term mating strategy, characterized by the pursuit of multiple sex partners (Jonason, Li, Webster, & Schmitt, 2009). These tendencies are unsurprising given that psychopathy is defined by emotional coldness and depleted empathy, which facilitate acts of promiscuity and infidelity (Hare, 1985).

A non-significant correlation was noted between narcissism and Sloth. Although some previous studies have reported correlations between these variables, these associations hinged on contextual caveats. For example, narcissism was linked to apathy—a reliable aspect of Sloth—only when the narcissistic self-concept of an individual was being challenged (Cohen, 1997). In the present study, this form of ego threat was likely not present, and therefore the relation between narcissism and Sloth did not emerge.

7. Conclusion

The present study represents a first step in identifying subclinical antisocial personality traits that may have been overlooked in previous investigation due to their potential incompatibility with traditional personality models. Specifically, we have identified a set of traits representing the capital vices that are associated with subclinical traits known to challenge contemporary personality frameworks. Consequently, we have extended work in support of personality model refinement, while simultaneously elaborating on existing research regarding the Dark Triad.

Of course, the present study is not without limitations. The results of the present study did not examine the effects of sex and age. Additional research assessing this point is needed. Further, the data for this study were obtained via self-report, which may have led to response biases. Consequently, peer-report investigations of the VAVS are also encouraged to replicate the present results.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.paid.2014.01.055>.

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