A Dark Web of Personality: Network Analyses of Dark Personality Features and Pathological Personality Traits

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Abstract

Network analysis offers an opportunity to gain a more nuanced view of the connections between the darker aspects of personality by examining the interrelationships between the components that make up these constructs. We examined the associations that five dark personality dispositions (i.e., narcissism, Machiavellianism, psychopathy, sadism, and spitefulness) had with pathological personality traits (i.e., antagonism, disinhibition, detachment, negative affectivity, and psychoticism) via network analysis. These dark personality networks were examined in four studies ($N = 1800$), wherein the second study attempted to replicate the network from the first study, while the last two studies incorporated more specific and independent measures of dark personality features (e.g., grandiose and vulnerable narcissism). Although there were differences across network structures in these studies, the pathological personality trait of antagonism consistently evinced high expected influence centrality (i.e., it was the most strongly connected and possibly influential trait in each network). Our discussion focuses on the implications of these results for the understanding of the connections between the darker aspects of personality.

Keywords Dark triad · Sadism · Spitefulness · Personality pathology · Network analysis

The *Dark Triad* is composed of three socially undesirable personality features: narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002). There are many robust associations between the Dark Triad traits and other personality traits. For example, a recent meta-analysis showed a strong positive association between extraversion and narcissism, a strong negative association between agreeableness and Machiavellianism, and a strong negative association between psychopathy and conscientiousness (Muris et al., 2017). Furthermore, these dark

personality features are associated with a host of negative psychosocial outcomes, such as erratic behavior, interpersonal difficulties, and promiscuity (e.g., Furnham et al., 2013).

The individual components of the Dark Triad demonstrate moderate-to-large intercorrelations (as high as .58 between Machiavellianism and psychopathy; Muris et al., 2017; Sleep et al., 2017) which suggests this shared variance may be caused by an overlap in the measures, as many questionnaires assess similar malevolent behaviors, such as a manipulative interpersonal style (Paulhus & Jones, 2014). This overlap may also stem from treating the individual aspects of the Dark Triad as unidimensional, despite strong evidence these dark personality traits have distinct features (Miller et al., 2019). For example, it is possible to distinguish the grandiose form of narcissism from its vulnerable form (Back et al., 2013) and recent conceptualizations of Machiavellianism have emphasized callousness and the ability to delay gratification as important aspects of this personality feature, alongside its hallmark feature of manipulativeness (Collison et al., 2018).

One recent approach that has sought to better understand the distinct aspects of the Dark Triad is by relating these features to pathological personality traits. Indeed, individual Dark Triad features are conceptualized as *subclinical* dispositions, placing them along the continuum of normal-to-abnormal personality

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functioning (Paulhus, 2014). In line with distinguishing between pathological personality traits, Krueger et al. (2012) developed a DSM-5 pathological trait model that has incremental validity over other trait-based approaches (e.g., the Five Factor Model) in assessing Machiavellianism (Grigoras & Wille, 2017), and has helped clarify features of narcissism (Miller et al., 2013) and psychopathy (Strickland et al., 2013). Thus, there is considerable evidence that dark personality features can be understood and assessed through general models of personality, such as the Five Factor Model (Costa & McCrae, 1990). Furthermore, these features can be conceptualized in terms of pathological personality traits, with burgeoning evidence to support the use of the DSM-5 pathological trait model in examining profiles of other dark personality features such as sadism (Plouffe et al., 2019) and spitefulness (Marcus et al., 2014). Taken together, these approaches to studying the darker aspects of personality have improved the understanding of the facets of these dark personality features.

Recent statistical advances in psychopathology and personality science, such as network analysis, may provide an alternative conceptualization of the Dark Triad. Cross-sectional network models assess relationships between variables (termed *nodes*) via partial correlations (termed *edges*; Epskamp et al., 2018). More specifically, network models are based on Gaussian Graphical Models (or GGMs), which assume that relationships between individual items or nodes are independent conditional on one another as opposed to a latent variable, consistent with the idea of network *theory* (Borsboom & Cramer, 2013). For example, instead of individual depressive symptoms stemming from some underlying common cause, network theory posits that depression arises from direct interactions between symptoms themselves (e.g., insomnia, concentration difficulties, and fatigue; Borsboom, 2017).[1]

Extending to personality, network models allow one to represent complex phenomena by revealing interesting patterns of relationships among manifestations of personality traits or constructs, patterns that may be missed if one focuses exclusively on latent variables (Epskamp et al., 2017). For instance, broad personality traits (e.g., conscientiousness) in the network perspective are not seen as explanations for individual differences (Costantini et al., 2019). Rather, the network perspective focuses on the specific, individual relationships between features of conscientiousness that make up this construct (e.g., dutifulness and self-efficacy). Extending to the Dark Triad constructs, this approach may reveal unique interrelationships between individual components that may not be apparent with a focus on more traditional statistical approaches, such as regression and factor analysis.

Statistical network models are often focused on the interpretation of edges (partial correlations) between nodes. As such, the associations in network models provide an estimate of the unique shared variance that each node has with every other node in the model. Mathematically, the estimation behind GGMs are similar to structural equation models (Kruis & Maris, 2016), but the theories underlying these models are quite different. For example, a researcher who believes that the various symptoms of depression are explained by a common cause (e.g., low levels of serotonin) may decide to fit a unidimensional factor model accounting for possible measurement error. Conversely, a researcher who believes that individual depressive symptoms may stem from interactions and/or feedback loops among the various symptoms of depression may select a statistical network model.

It is important to note that the statistical equivalence of these models does not mean that they are merely alternative representations of the *same* underlying processes. That is, the use of either model is done to represent the underlying data-generating mechanism (van Bork et al., in press). A latent variable model of dark personality features is based on the assumption that the correlations between observed variables (manipulativeness, amorality, callousness) are the result of a latent common cause (trait Machiavellianism). In contrast, a network model is often based on an epistemic uncertainty surrounding how specific variables interact to give rise to a particular construct. For example, a network model concerning Machiavellianism may show that callousness promotes amorality which, in turn, may contribute to manipulative behaviors rather than each characteristic simply being a manifestation of the underlying trait of Machiavellianism. A network model has the potential to reveal important connections between dark personality features and pathological personality traits which may offer insights into which pathological personality traits are the most influential for these dark personality features.

Overview

Network analysis may offer a more nuanced perspective into the structure of the darker aspects of personality, with the goal of this study being to expand upon prior network analyses of dark personality features by examining their interrelationships with pathological personality traits. In addition, we were interested in other malevolent personality features closely associated with the Dark Triad traits, such as spitefulness and sadism, that may add further explanatory value (Marcus et al., 2014; Plouffe et al., 2017). Previous investigations of the dark personality features via network analysis have revealed unique associations between these features. For example, Marcus et al. (2018) found that the interpersonal manipulation and callousness facets of psychopathy were highly central nodes in their networks of the Dark Triad traits. More specifically,

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[1] Of course, causal associations cannot be estimated solely with cross-sectional data, as we emphasize further in our limitations section. Cross-sectional network models are best seen as exploratory or hypothesis-generating structures.

interpersonal manipulation shared a strong connection with Machiavellianism and callousness shared a strong connection with spitefulness. Further, Papageorgiou et al. (2019) found narcissism to be a relatively unique trait within the Dark Triad, given its connections to behaviors associated with stress management (e.g., control over one's feelings and pursuit of goals), possibly serving as a bridge between the dark and agentic features of personality. More recently, Trahair et al. (2020) found that Machiavellianism and psychopathy were strongly interrelated, with the more antagonistic facets of narcissism providing the link that connected Machiavellianism and psychopathy to the more agentic facets of narcissism.

In sum, recent work conceptualizing the Dark Triad and related personality features as networks have helped to facilitate a clearer and more nuanced understanding of the similarities and differences among these features, as well as helped to clarify which features are most central or influential. However, to the best of our knowledge, no research has used a network model to examine the associations between dark personality features and pathological personality traits. Drawing from prior findings showing strong relationships between the pathological personality trait of antagonism and dark personality features (e.g., Plouffe et al., 2019; Wissing & Reinhard, 2017; Zeigler-Hill & Noser, 2018), we hypothesized that the dark personality features would be closely related to antagonism, but we were also interested in further exploring connections between these features and other pathological personality traits, such as detachment, disinhibition, and negative affectivity because prior research has suggested these other traits share some overlap with these specific dark personality features (e.g., negative affectivity and narcissism; Edershile et al., 2019). Therefore, examining divergent relationships between these pathological personality traits and dark personality features via network analysis may help further reveal unique associations not otherwise detailed in previous research.

Recent criticisms of the Dark Triad literature and recommendations to improve on this literature emphasize the importance of multidimensional assessment and replicability across samples (e.g., Miller et al., 2019). Therefore, we sought to examine networks of dark personality features and pathological personality traits across four studies, presenting the networks in a stepwise manner. In Study 1, we detail a network comprised of pathological personality traits assessed via the Personality Inventory for DSM-5 (Krueger et al., 2012) and the Short Dark Triad (D.N. Jones & Paulhus, 2014), providing an initial examination of the network structure of how these features are interrelated. Next, we aimed to replicate this network in Study 2, using the same variables as in Study 1.

In Study 3, we expand upon the multidimensional nature of the key Dark Triad features, such as narcissism, by examining both grandiose and vulnerable narcissism. We also include a measure of sadism, an important dark personality feature that some suggest be combined with the Dark Triad to form the Dark *Tetrad* (e.g., Paulhus, 2014). Further, given an increase in sample size, we assessed sex differences in the structure of this network, emphasizing the potential influence that biological sex may have for the associations among these constructs (Grijalva et al., 2015). For example, narcissism is strongly positively associated with trait masculinity, whereas trait femininity is negatively associated with Machiavellianism, narcissism, and psychopathy (Jonason & Davis, 2018) and women score higher in the domain of negative affectivity, whereas men score higher on antagonism (Granieri et al., 2017). Thus, we were also interested in investigating whether the network structures of men and women differ, given the possibility that certain dark personality features or pathological personality traits may be more central in their respective networks.

Lastly, in Study 4, we examined the Dark Triad traits with different measures of narcissism, psychopathy, and Machiavellianism in relation to spitefulness and pathological personality traits, further seeking to examine the distinct facets of psychopathy and narcissism. The main analysis for each of these studies was conducted in a similar manner. A full overview of the specific estimation procedures for analyzing node redundancy, the networks themselves, as well as centrality, stability, and accuracy analyses, are listed as supplemental materials.[2] For each study, we describe the method, procedures, and results below.

Study 1

In this initial study, we detail the network structure of dark personality features and pathological personality traits using the Short Dark Triad and the Personality Inventory for DSM-5 – Brief Form. More specifically, we were interested in the relationships between narcissism, Machiavellianism, and psychopathy, and whether there were unique relationships between these dark personality features and pathological personality traits (i.e., antagonism, disinhibition, detachment, negative affectivity, and psychoticism). This network is the first in a series of studies examining how dark personality features and pathological personality traits are interrelated.

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[2] In addition, the supplemental materials include reproducible R code, additional figures (e.g., from stability and accuracy analyses), and the data from each study. These materials are available at https://doi.org/10.17605/OSF.IO/NHG2S. Given these networks were constructed in a more exploratory manner, and that we had a broad, overarching hypothesis for antagonism, the data analytic plan was not pre-registered in an independent directory.

Method

Participants and Procedure

Predominantly (70%) white/European American participants ($N = 294$; 142 men), aged 18–71 years ($M = 35.51$, $SD = 11.03$) were paid US$1 through Amazon's Mechanical Turk (MTurk) to complete an online questionnaire (see Jonason & Fletcher, 2018). MTurk is an online crowdsourcing platform where anonymous online participants complete web-based studies for small sums of money and has been shown to be an effective and reliable method for collecting self-report data (Chandler & Shapiro, 2016). The minimum sample size was determined based on power analysis for the average effect size in social and personality psychology ($r \approx .20$; Richard et al., 2003) and guidelines ($N \approx 250$) set for reducing estimation error in personality psychology (Schönbrodt & Perugini, 2013). Only those participants from unique IP addresses were included to avoid violating the assumption of independence and only those participants who completed all the items were included to address any concerns regarding missing data. Participants were informed about the nature of study and if they consented, proceeded through a series of self-report measures described below. Upon completion, participants were thanked, debriefed, and paid.

Measures

Personality Inventory for DSM-5 – Brief Form (PID-5-BF) The PID-5-BF (Krueger et al., 2012) is 25-item self-report measure that assesses five broad pathological personality trait dimensions: *antagonism* (5 items; e.g., "It's no big deal if I hurt other peoples' feelings" [$\alpha = .68$]), *disinhibition* (5 items; e.g., "I feel like I act totally on impulse" [$\alpha = .79$]), *detachment* (5 items; e.g., "I'm not interested in making friends" [$\alpha = .79$]), *negative affectivity* (5 items; e.g., "I worry about almost everything" [$\alpha = .81$]), and *psychoticism* (5 items; e.g., "I have seen things that weren't really there" [$\alpha = .84$]). Participants were asked to rate how accurately each item described them using scales that ranged from 0 (*very false or often false*) to 3 (*very true or often true*), wherein higher scores are indicative of greater personality pathology. The PID-5-BF has demonstrated adequate psychometric properties in previous studies (e.g., Anderson et al., 2018).

Short Dark Triad (SD3) The SD3 (D.N. Jones & Paulhus, 2014) is a 27-item instrument that was used to measure *narcissism* (9 items; e.g., "People see me as a natural leader" [$\alpha = .75$]), *Machiavellianism* (9 items; e.g., "Make sure your plans benefit you, not others" [$\alpha = .84$]), and *psychopathy* (9 items; e.g., "People who mess with me always regret it" [$\alpha = .77$]). Participants were asked to indicate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). This measure has demonstrated adequate psychometric properties in previous studies (D.N. Jones & Paulhus, 2014).

Results and Discussion

Figure 1 depicts the GGM estimated in this study using the PID-5-BF subscales and SD3 subscales as nodes. Table 1 details the node labels from each figure for each study. Table S1 provides an overview of the descriptive statistics (means, standard deviations, and skewness and kurtosis values) of each node. The goldbricker function in the R package *networktools* (used to identify redundant nodes; P.J. Jones, 2019) did not identify any nodes as colinear. Accuracy and stability analyses (see Supplemental Figs. S1-S3) indicated some variability in edge-weight estimation (likely due to sample size), with the strongest and most reliable edges being between Machiavellianism and psychoticism, between detachment and psychoticism, between disinhibition and psychoticism, and between psychopathy and antagonism.

Overall, psychoticism, psychopathy, and antagonism evinced high expected influence, with psychoticism sharing strong connections with detachment (regularized partial correlation edge weight = 0.35) and disinhibition (partial correlation edge weight = 0.34), suggesting the high expected influence of psychopathy is likely a result of its connections to other pathological personality traits. The individual Dark Triad components were strongly interrelated, with psychopathy sharing particularly strong connections with Machiavellianism (partial correlation edge weight = 0.39) and narcissism (partial correlation edge weight = 0.25). Lastly, and as expected, antagonism shared prominent connections with psychopathy (partial correlation edge weight = 0.29) and narcissism (partial correlation edge weight = 0.18). Surprisingly, however, antagonism was unrelated to Machiavellianism, with detachment being the only pathological personality node connected to Machiavellianism (partial correlation edge weight = 0.27). Thus, these initial findings detail some discriminant relationships between Dark Triad features and pathological personality traits, implicating the role of antagonism as an important pathological personality trait.
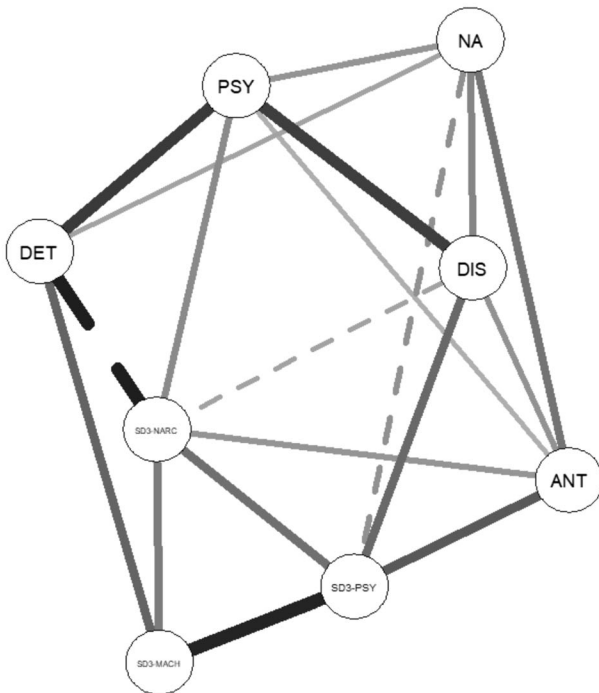
Study 2

Study 1 provided the first attempt to examine the interrelationships between dark personality features and pathological personality traits. Psychoticism, psychopathy, and

Table 1 Node descriptions from the four main networks

Node label	Item/Subscale
ADMIRE	NARQ Narcissistic Admiration
ANT	PID-5-BF Antagonism
ASP	Assessment of Sadistic Personality
CAST/CAL	Combined CAST / SRP Callous Affect
CRM/INT	Combined SRP Criminal Tendencies / SRP Interpersonal Manipulation
DET	PID-5-BF Detachment
DIS	PID-5-BF Disinhibition
MACH-IV	MACH-IV
NA	PID-5-BF Negative Affectivity
NPI-EE	NPI Exploitation/Entitlement
NPI-GE	NPI Grandiose Exhibitionism
NPI-LE	NPI Leadership/Authority
PSY	PID-5-BF Psychoticism
RIVAL	NARQ Narcissistic Rivalry
SD3-MACH	SD3 Machiavellianism
SD3-NARC	SD3 Narcissism
SD3-PSY	SD3 Psychopathy
SPITE	Spitefulness Scale
SRPS-ER	SRP Erratic Lifestyle

Note. The combined nodes are a result of the goldbricker and reduce_net functions in *networktools* identifying the separate nodes as colinear and combining them into one
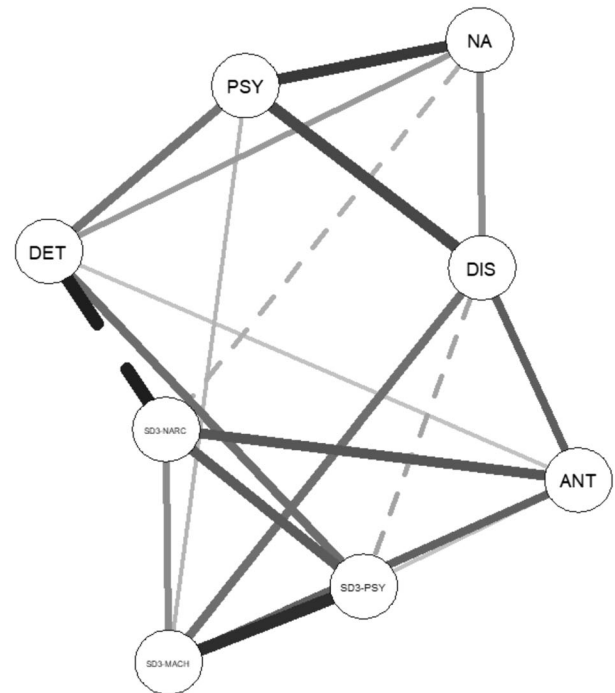

Fig. 1 EBIC graphical LASSO networks for Studies 1 and 2. See Table 1 for node descriptions. *Note.* Solid edges indicate positive associations, whereas dashed edges represent negative associations. Edge thickness represents the magnitude of the association. The positioning of the nodes are based on an algorithm with the purpose of constructing a more easily interpretable graph and thus any distance between nodes or the spatial proximity of nodes is considered trivial

antagonism were all highly central, with psychopathy sharing many connections with pathological personality nodes, as well as strong connections with other Dark Triad nodes (i.e., Machiavellianism and narcissism). Study 2 aimed to replicate this network, utilizing the same nodes as in Study 1.

Method

Participants and Procedure

Predominantly white (79%) American adults ($N = 266$; 141 men), aged 18–66 ($M = 34.29$ years, $SD = 9.99$) were paid US\$1 through Amazon's MTurk to complete an online questionnaire (see Jonason et al., 2020a). The minimum sample size was determined based on a power analysis for the average effect size in social and personality psychology ($r \approx .20$; Richard et al., 2003) and guidelines ($N \approx 250$) set for reducing estimation error in personality psychology (Schönbrodt & Perugini, 2013). Participants were told the study was about personality and political attitudes. If they consented, they proceeded through several self-report measures (some not reported here), and at completion, were thanked and debriefed.

Measures

We replicated two scales from Study 1. First, we used the PID-5-BF, which again evinced acceptable internal consistency (Negative Affectivity [$\alpha = .78$], Detachment [$\alpha = .78$], Antagonism [$\alpha = .79$], Disinhibition [$\alpha = .83$], and Psychoticism [$\alpha = .85$]). Second, we used the SD3 scale, which also demonstrated good internal consistency (narcissism [$\alpha = .79$], Machiavellianism [$\alpha = .83$], and psychopathy [$\alpha = .78$]).

Network Comparison Test

As we were interested whether the network from Study 1 was replicated in Study 2, we compared these network structures using the R package *NetworkComparisonTest* (NCT; van Borkulo, 2016). The NCT is a two-tailed permutation test in which the difference between two groups is calculated repeatedly (100,000 times) for randomly regrouped individuals. This test results in a distribution under the null hypothesis (i.e., both group networks are equal), which can be used to test the observed difference between such groups (van Borkulo, 2016). Specifically, NCT provides a global invariance metric, determining whether the overall conceptual model of all parts (i.e., nodes and edges) differ (Levinson & Williams, 2020). In addition, the NCT also provides a maximum edge-weight test metric, which assesses whether *individual* edges differ between networks by calculating the differences between specified edges and nodes (Levinson & Williams, 2020).

Results and Discussion

Figure 1 also presents the GGM estimated in this study using the PID-5-BF and SD3. We did not conduct the node redundancy analysis on these data as we were interested in replicating the network from Study 1. Table S2 provides an overview of the descriptive statistics (means, standard deviations, and skewness and kurtosis values) of each node. Accuracy and stability analyses (see Supplemental Figs. S4-S6) also indicated some variability in edge-weight estimation, with the strongest and most reliable edges being between Machiavellianism and psychoticism (as in Study 1), between negative affectivity and psychoticism, between disinhibition and psychoticism, and between antagonism and narcissism.

Overall, and similar to the network presented in Study 1, psychoticism, psychopathy, and antagonism were highly central, with psychopathy again sharing particularly strong connections with Machiavellianism (partial correlation edge weight = 0.35) and narcissism (partial correlation edge weight = 0.27). Furthermore, antagonism also shared a strong connection with narcissism (partial correlation edge weight = 0.28), albeit a weaker connection with psychopathy in this study (partial correlation edge weight = 0.10). One notable difference was that antagonism shared a strong connection with Machiavellianism in this study (partial correlation edge weight = 0.26), whereas there was no connection between these two nodes in Study 1.

Network Comparison Test

The global invariance test suggested that the null-hypothesis that the networks from Study 1 and Study 2 did not differ in terms of their network structure cannot be rejected ($p = .50$). Given that the NCT requires considerable power to reject the null hypothesis, we also correlated the adjacency matrices of the two networks to obtain a measure of similarity. There was a positive correlation between the adjacency matrices of the two networks ($r = .58$, $p < .001$) which supports the notion that the two networks did not differ in their overall network structure. However, the maximum edge-test was significant ($p < .01$) which suggests that the networks differed in terms of specific edge weights (e.g., between narcissism and negative affectivity and between psychoticism and disinhibition).

Study 3

Study 2 detailed another network comprised of the dark personality features and pathological personality traits, assessing the extent to which this network structure was similar to Study 1. This network structure differed somewhat from Study 1, particularly with the strong connection

between Machiavellianism and antagonism. However, key pathological personality traits remained highly central, such as antagonism and psychoticism. In Study 3, we aimed to assess the multidimensional nature of dark personality features by including different measures of narcissism and a measure of sadism.

Narcissism is a heterogeneous construct, and can be conceptualized as a grandiose or vulnerable expression, with the former being defined as involving more attention-seeking behaviors, and the latter being defined by feelings of inadequacy and incompetence (Miller et al., 2011). By including these various measures of narcissism, we were able to comprehensively examine the different forms and operationalizations of this construct. More specifically, we used the SD3 (as in Studies 1 and 2) but we also included measures assessing grandiose narcissism and vulnerable narcissism which are believed to be distinct expressions that share certain characteristics (e.g., entitlement; Rogoza et al., 2018). Inclusion of measures that assess these varying components of narcissism is in line with recent frameworks and models seeking integration and organization of these components (Krizan & Herlache, 2018; Miller et al., 2017). As such, inclusion of the distinct theoretically important elements of narcissism (e.g., grandiosity, entitlement, vulnerability) within this network can further uncover which elements may be more strongly related to other dark personality features or pathological personality traits. The inclusion of these additional aspects of narcissism also allowed us to assess whether there is any overlap between these measures via redundancy analysis.

Furthermore, within this network, we included a measure of sadism, a personality trait broadly defined as the tendency to experience pleasure from another's pain (Foulkes, 2019), and is an increasingly important construct studied in relation to the Dark Triad. For example, recent work has suggested that sadism should be included along with narcissism, Machiavellianism, and psychopathy to form the "Dark Tetrad" (Johnson et al., 2019). The basis for this suggestion is that sadism is taxonomically-relevant to the Dark Triad given that descriptions of this construct center around callousness and impaired empathy (Paulhus et al., in press). However, sadism also adds a unique component that is not captured by the Dark Triad traits because its defining feature involves deriving pleasure from hurting others (Plouffe et al., 2017).

We also introduce a measure of spitefulness. Spitefulness is a personality feature that is thought to be characterized by antagonism, and involves engaging in behavior or expressing a preference that harms another but also entails harm to oneself (Marcus et al., 2014). In addition, prior research has assessed the role of spitefulness in networks of dark personality features (e.g., Marcus et al., 2018). Lastly, we constructed separate networks for

men and women, aiming to assess for differences in these network structures, further exploring and emphasizing the importance of sex differences between dark personality features (Jonason et al., 2020b).

Method

Participants and Procedure

Participants were 426 adults from the United States who were recruited using Amazon's MTurk in exchange for financial compensation (US$2) and 412 undergraduate students who were recruited from a university in the Midwestern region of the United States in exchange for partial fulfillment of a research participation requirement. We used a financially-based stopping rule for the community members such that we collected data from MTurk participants in small batches until the funds for the study were exhausted, whereas we used a time-based stopping rule for the undergraduates such that we collected data from as many participants as possible during the course of a single academic semester. Participants completed measures concerning pathological personality traits and dark personality features – along with other measures that were not particularly relevant to the present study (e.g., self-esteem) – via a secure website (see Zeigler-Hill et al., in press, for additional details). Data were excluded for 105 participants who failed to successfully complete two or more of the directed response items that were included in the instruments to identify inattentive responding (e.g., "Answer this item with 'Strongly Disagree'"). The final 733 participants (448 women) were predominantly (72%) white/European American, aged 18–71 years ($M = 27.07$ years, $SD = 10.18$).

Measures

As in Study 2, we once again used the PID-5-BF and the SD3. The PID-5-BF again evinced good internal consistency (Negative Affectivity [$\alpha = .70$], Detachment [$\alpha = .68$], Antagonism [$\alpha = .73$], Disinhibition [$\alpha = .76$], and Psychoticism [$\alpha = .80$]), as did the SD3 (Narcissism [$\alpha = .73$], Machiavellianism [$\alpha = .73$], and Psychopathy [$\alpha = .73$]). In this study, we introduced two other measures of narcissism, a measure of sadism, and a measure of spitefulness.

Narcissistic Admiration and Rivalry Questionnaire (NARQ) The NARQ (Back et al., 2013) is an 18-item self-report measure that captures two dimensions of grandiose narcissism: *narcissistic admiration* (9 items; e.g., "I enjoy my successes very much" [$\alpha = .86$]) and *narcissistic rivalry* (9 items; e.g., "I secretly take pleasure in the failure of my rivals" [$\alpha = .90$]). Both dimensions differentiate between affective-motivational, cognitive, and behavioral processes associated with maintaining a grandiose self. Participants indicated their level of agreement

with each statement using scales that ranged from 1 (*not agree at all*) to 6 (*agree completely*). The narcissistic admiration and narcissistic rivalry subscales of the NARQ have demonstrated adequate psychometric properties in previous research (e.g., Back et al., 2013; Leckelt et al., 2015). Previous research has shown that the NARQ evinced convergent and divergent validity with the SD3. For example, narcissistic admiration is strongly correlated with the SD3 narcissism subscale, whereas narcissistic rivalry is weakly correlated with this subscale (Hart & Richardson, 2020). In addition, recent research has incorporated both the NARQ and SD3 within a network, showing unique relationships between these scales (e.g., no edge between SD3 narcissism and narcissistic rivalry; Trahair et al., 2020). Continued investigation of these scales within a network via redundancy analysis can further empirically examine the extent to which the constructs captured by these scales actually overlap.

Narcissistic Vulnerability Scale (NVS) The NVS (Crowe et al., 2018) is an 11-item self-report measure of narcissistic vulnerability features that includes attributes such as "self-absorbed," "insecure," and "fragile." Participants rated how well each adjective described them using scales that ranged from 1 (*not at all*) to 6 (*extremely*). The internal consistency for the NVS was high ($\alpha = .92$) in the present study and this measure has demonstrated adequate psychometric properties in previous research (Crowe et al., 2018). The NVS has evinced convergent and divergent validity with other narcissism measures. For example, the NVS has been shown to be modestly correlated with the narcissistic rivalry subscale from the NARQ, but uncorrelated with the narcissistic admiration subscale (Crowe et al., 2018). However, the NVS appears to be more strongly correlated with specific measures assessing hypersensitivity and insecurity (Crowe et al., 2018). As such, inclusion of the NVS along with the SD3 and the distinct subscales of the NARQ within the same network allows for an understanding of the unique associations that these measures of narcissism have with the other dark personality features and pathological personality traits.

Assessment of Sadistic Personality Scale (ASP) The ASP (Plouffe et al., 2017, 2019) is a 9-item measure of subclinical sadism, a tendency to engage in or think about engaging in cruel, demeaning, or aggressive behaviors for pleasure or subjugation (e.g., "I never get tired of pushing people around" [$\alpha = .92$]). Participants were asked to indicate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). These items correspond to a total scale score such that higher scores indicate greater endorsement of sadistic thoughts and/or behaviors. The ASP has demonstrated adequate psychometric properties in previous research (Plouffe et al., 2019).

Spitefulness Scale The Spitefulness Scale (Marcus et al., 2014) is a 17-item self-report measure designed to assess the willingness of respondents to engage in behaviors that would harm another individual but that would also entail potential harm to the respondent (e.g., "Part of me enjoys seeing the people I do not like fail even if their failure hurts me in some way" [$\alpha = .73$]). Participants were asked to indicate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). This measure has demonstrated adequate psychometric properties in previous studies (e.g., Marcus et al., 2014; Zeigler-Hill & Vonk, 2015).
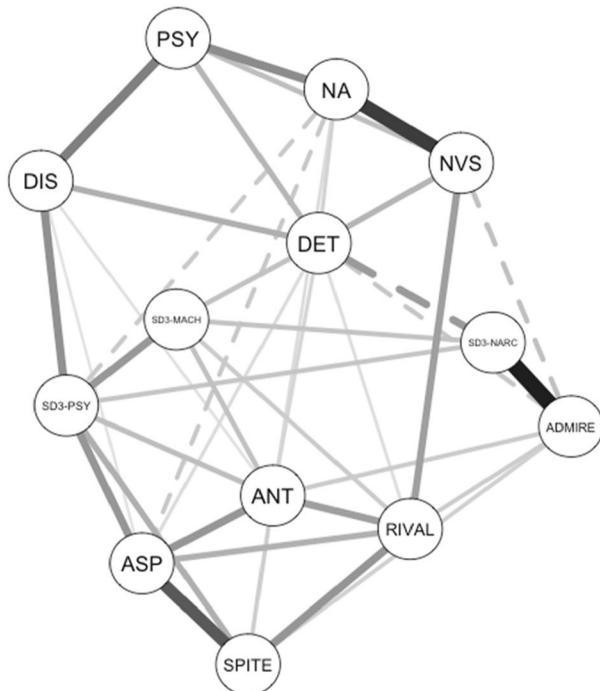
Results and Discussion

Figure 2 displays the estimated GGM of the dark personality features and pathological personality traits indexed by the PID-5-BF, SD3, NARQ, ASP, Spitefulness Scale, and NVS. Table S3 provides an overview of the descriptive statistics (means, standard deviations, and skewness and kurtosis values) of each node. Accuracy and stability analyses (see Supplemental Figs. S7-S9) indicated minimal variability in edge-weight estimation, with the strongest and most reliable edges being between SD3-Narcissism and narcissistic admiration, negative affectivity and narcissistic vulnerability, between sadism and spitefulness, and between disinhibition and psychoticism. The goldbricker function did not identify any nodes as colinear. Regarding dark personality features, there was a strong connection between narcissism measured via the SD3 and narcissistic admiration (partial correlation edge weight = 0.50). Interestingly, narcissistic rivalry shared no connection with this SD3 narcissism node, suggesting that narcissistic admiration and narcissistic rivalry have divergent associations with other dark personality features. Indeed, narcissistic rivalry shared a connection with sadism (partial correlation edge weight = 0.17), but there was no connection between sadism and narcissistic admiration.

Overall, antagonism once more evinced high expected influence centrality, showing strong connections with sadism (partial correlation edge weight = 0.22), narcissistic rivalry (partial correlation edge weight = 0.21), and psychopathy (partial correlation edge weight = 0.14). Spitefulness was also highly central, and had notable connections with sadism (partial correlation edge weight = 0.36) and narcissistic rivalry (partial correlation edge weight = 0.23). Lastly, psychopathy was also a highly central node, with notable connections to sadism (partial correlation edge weight = 0.22), Machiavellianism (partial correlation edge weight = 0.22), and SD3 narcissism (partial correlation edge weight = 0.14).

Network Comparison Test

As we were interested in the network structure of dark personality features and pathological personality traits for men
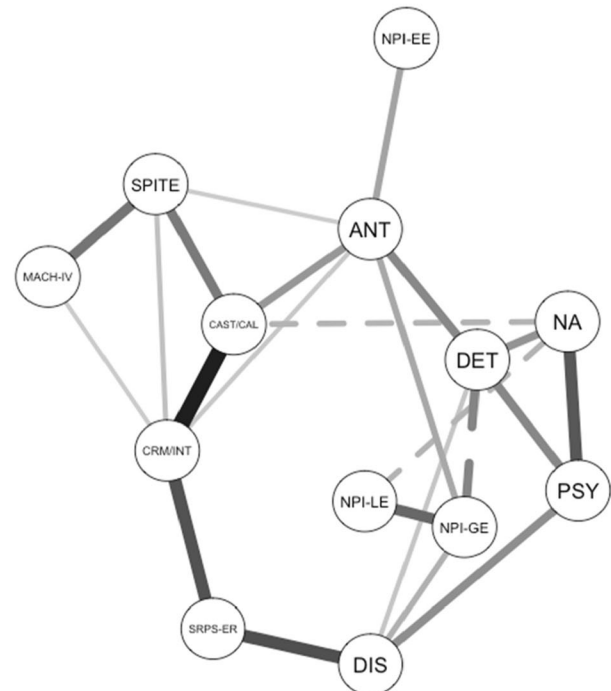
Study 3 Network

Study 4 Network

Fig. 2 EBIC graphical LASSO networks for Studies 3 and 4. See Table 1 for node descriptions. *Note*. Solid edges indicate positive associations, whereas dashed edges represent negative associations. Edge thickness represents the magnitude of the association. The positioning of the

nodes are based on an algorithm with the purpose of constructing a more easily interpretable graph and thus any distance between nodes or the spatial proximity of nodes is considered trivial

and women, we constructed separate networks for men and women from this sample in the same fashion as the main network (i.e., with *EBICglasso* regularization) and formally compared these networks using the NCT. Both the global invariance test and the maximum edge-weight test were non-significant ($p = .72$ and $p = .51$, respectively), suggesting that the null-hypothesis that the networks for men and women did not differ in terms of network structure and specific edge weights cannot be rejected. In addition, we correlated the adjacency matrices of the two networks to obtain a measure of similarity. The resulting correlation ($r = .80$, $p < .001$) indicated a high degree of similarity between the two network structures.

Study 4

Study 3 examined a more detailed network of dark personality features and pathological personality traits, using different measures to capture the multidimensional nature of certain features (e.g., narcissism). In this network, psychoticism, as well as spitefulness and narcissistic rivalry, were highly central, but there was limited evidence for structural network differences between the sexes. However, it is possible these dark personality features could be examined with even greater specificity. For instance, alternative and longer measures of

sadism, narcissism, psychopathy, and Machiavellianism exist and may detail slightly different networks than the measures used in Study 3. In addition, psychopathy and narcissism (at least) are multifaceted and the Short Dark Triad is incapable, by design, to be reduced to lower-order factors. Therefore, in Study 4, we attempted to replicate our findings with different measures of the Dark Triad and an alternative measure of sadism. Again, we were concerned with the network system of these dark personality features based on pathological personality traits and whether these networks are invariant for men and women.

Method

Participants and Procedure

Participants were 507 undergraduate students (380 women) who were recruited from a university in the Midwestern region of the United States in exchange for partial fulfillment of a research participation requirement. We used a time-based stopping rule for data collection such that we collected data from as many participants as possible during the course of a single academic semester. Participants completed measures concerning pathological personality traits and dark personality features – along with other measures that were not particularly relevant to the present study (e.g., self-esteem) – via a secure

website. The participants were predominantly (75%) White, aged 18–48 years ($M = 20.14$ years, $SD = 3.29$).

Measures

We used two scales from our previous studies. First, we used the PID-5-BF, which again evinced acceptable internal consistency (Negative Affectivity [$\alpha = .70$], Detachment [$\alpha = .68$], Antagonism [$\alpha = .73$], Disinhibition [$\alpha = .76$], and Psychoticism [$\alpha = .80$]). Second, we used the Spitefulness Scale which also demonstrated good internal consistency ($\alpha = .92$). We also used different measures than Study 3 described next.

Narcissistic Personality Inventory (NPI) The NPI (Raskin & Hall, 1979) is a 40-item measure assessing narcissistic personality features. Items on the NPI are presented in a forced-choice format such that respondents must select either a narcissistic or a non-narcissistic response for each item (e.g., "I like having authority over other people" or "I don't mind following orders"). For this study, we used the three subscales of the NPI suggested, by Ackerman et al. (2011): leadership/authority (11 items; e.g., "I am a born leader" [KR-20 = .79]), grandiose exhibitionism (10 items; e.g., "I really like to be the center of attention" [KR-20 = .72]), and exploitation/entitlement (4 items; e.g., "I will never be satisfied until I get all that I deserve" [KR-20 = .41]). The leadership/authority and the grandiose exhibitionism subscales demonstrated adequate internal consistency. However, the internal consistency for the exploitation/entitlement subscale was relatively poor, which is consistent with previous research (e.g., Marcus et al., 2014). The poor internal consistency for the exploitation/entitlement subscale is most likely caused, at least in part, by it only consisting of four items and using a dichotomous scoring system (Ackerman et al., 2011).

Mach-Iv The MACH-IV (Christie, 1970) is a 20-item self-report measure designed to assess Machiavellianism (e.g., "The best way to handle people is to tell them what they want to hear" [$\alpha = .75$]). Participants were asked to rate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The MACH-IV has demonstrated adequate psychometric properties in previous research (e.g., Marcus et al., 2018).

Self-Report Psychopathy Scale (SRP) The SRP (Paulhus, Neumann, & Hare, 2016) is a self-report measure of psychopathy. The version of the SRP used in this study was based on the factor analysis reported by Mahmut et al. (2011) which revealed the following dimensions: *callous affect* (8 items; e.g., "I am often rude to people" [$\alpha = .75$]), *erratic lifestyle* (8 items; e.g., "I'm a rebellious person" [$\alpha = .78$]),

interpersonal manipulation (8 items; e.g., "I find it easy to manipulate people" [$\alpha = .68$]), and *criminal tendencies* (10 items; e.g., "Been arrested" [$\alpha = .82$]). Participants were asked to rate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). This measure has demonstrated adequate psychometric properties in previous studies (e.g., Garofalo et al., 2019).

Comprehensive Assessment of Sadistic Tendencies (CAST) The CAST (Buckels et al., 2013) is an 18-item self-report measure of sadism (e.g., "I enjoy physically hurting people" [$\alpha = .88$]). Participants were asked to rate their level of agreement with each item using scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The CAST has demonstrated adequate psychometric properties in previous studies (e.g., Jonason et al., 2017).

Results and Discussion

Figure 2 displays the estimated GGM of the dark personality features and pathological personality traits indexed by the PID-5-BF, NPI, MACH-IV, SRPS, CAST, and the Spitefulness Scale. The goldbricker function identified two pairs of nodes as colinear so they were combined: criminal tendencies/interpersonal manipulation ("CRM/INT;" measured via the SRP), and sadism/callous affect ("CAST/CAL;" measured via the CAST and SRP, respectively). Table S4 provides an overview of the descriptive statistics (means, standard deviations, and skewness and kurtosis values) of each node. Accuracy and stability analyses (see Supplemental Figs. S10-S12) indicated minimal variability in edge-weight estimation, with the strongest and most reliable edges being between the combined criminal tendencies/interpersonal manipulation node, disinhibition and erratic lifestyle, between erratic lifestyle and the combined criminal tendencies/interpersonal manipulation node, and between negative affectivity and psychoticism.

Like the network detailed in Study 3, there were strong connections among individual nodes that comprise the PID-5-BF. In addition, antagonism once more evinced high expected influence centrality, with notable connections to detachment (partial correlation edge weight = 0.22), grandiose exhibitionism (partial correlation edge weight = 0.16), exploitation/entitlement (partial correlation edge weight = 0.17), and sadism/callous affect (partial correlation edge weight = 0.20). Overall, however, the combined criminal tendencies/interpersonal manipulation node (two aspects of psychopathy) was the most highly central node in this network. Its strongest connections were with erratic lifestyle (partial correlation edge weight = 0.34) and sadism/callous affect (partial correlation edge weight = 0.44), suggesting that psychopathy

features are an important source of activation for other nodes in this network.

Network Comparison Test

As in Study 3, both the global invariance test and the maximum edge-weight test were non-significant ($p = .47$ and $p = .31$, respectively), suggesting that the networks in men and women did not differ in terms of network structure and specific edge weights. In addition, the correlation between adjacency matrices ($r = .59$, $p < .001$) indicated a moderate degree of similarity between the two network structures.

General Discussion

The goal of the present research was to assess the network structure of dark personality features and pathological personality traits, using different measures of dark personality features, as well as constructs closely aligned with the Dark Triad (e.g., sadism). Across four studies, antagonism consistently emerged as a highly central node, sharing strong connections with dark personality features such as psychopathy and narcissism (Study 1), Machiavellianism (Study 2), sadism (Study 3), and spitefulness (Study 4). These results are similar to other results supporting the notion that antagonism explains overlap between Dark Triad features (e.g., D. N. Jones & Figueredo, 2013). Further, by examining distinct features of key Dark Triad components, we were able to examine the role of antagonism in a more specific manner, such as how antagonism was related to narcissistic grandiose exhibitionism but not narcissistic leadership/authority (Study 4).

The relationships between antagonism and other dark personality features are also highly consistent with previous trait-based studies of the Dark Triad. For example, low agreeableness is a strong, consistent correlate of narcissism, Machiavellianism, and psychopathy (Muris et al., 2017). Indeed, antagonism itself was considered to be a shared feature of the Dark Triad traits in its initial conceptualization (Paulhus & Williams, 2002), with later research implicating antagonism as a core feature of psychopathy specifically (Miller & Lynam, 2015). However, network analysis provides a structural approach to the relationship between antagonism and dark personality features that has not been otherwise detailed and suggests that direct relationships among certain features could explain why these distinct facets often covary (Costantini & Perugini, 2018). Such a conceptualization of dark personality features (and personality in general) offers an interesting dialogue that does not rely on factorial trait labels to explain why such relationships occur (Baumert et al., 2019). Rather, the factorial (or higher-order) traits can be seen as *emergent* in the network approach, stemming from the interactions between individual components, where the

main focus shifts to an understanding of the mechanisms other than latent variables that explain the observed covariation (although this level of causal inference cannot be assumed with non-longitudinal or non-experimental data; Baumert et al., 2019). Antagonism, then, may be one mechanism that explains the relationship between dark personality features and pathological personality traits, with the presented studies detailing a set of hypothesis-generating network structures that implicate antagonism as a core feature of this network.

Along with antagonism, psychoticism was also highly central, which is somewhat surprising, given the prototypical features of this construct (e.g., perceptual problems). However, psychoticism also involves eccentricity, unusual beliefs and experiences, and odd behaviors (Hopwood et al., 2013; Miller et al., 2018). Some research has shown a negative association between psychoticism and binding values (i.e., values surrounding group cohesion and social order; Noser et al., 2015). Thus, it could be that non-normative thoughts or beliefs captured by psychoticism may partially explain why this pathological personality trait was highly central in these studies. However, like antagonism, it is not possible to discern which specific facets of psychoticism (e.g., perceptual problems or unusual beliefs) relate to different dark personality features from these main analyses.

Fortunately, network analysis allows a flexible approach to determining what level of aggregation is informative. That is, different units or components may be useful for different purposes. Single items from a measure may be useful in providing a fine-tuned understanding of a personality structure, whereas aggregates (e.g., facets or subscales) may imply a loss in terms of definition, but a gain in terms of reliability.[3] To better understand the network structures presented in the main studies, we were particularly interested in how specific items from the antagonism and psychoticism subscales related to these dark personality features in our exploratory analysis, as they were highly central pathological personality traits across each study.[4]

Antagonism involves callous or antisocial features as well as grandiosity and attention-seeking behaviors (Hopwood et al., 2013). By examining distinct features of antagonism, there were some divergent relationships. Craving attention was a notable example, as it shared a strong connection with narcissism. When examining distinct facets of narcissism, craving attention was specifically related to narcissistic

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[3] In fact, one interesting way to approach network construction may be to use scales that are *unreliable*, as this mitigates construct overlap (given most scales are constructed for latent variable modeling). However, no guides on scale construction from a network point of view currently exist.

[4] A full write up of the main exploratory analyses that examined individual antagonism and psychoticism items in relation to the SD3 (combining data from Studies 1, 2, and 3) is available in the supplemental materials. Further, the edge weight matrices for the relationships between individual antagonism and psychoticism items and each node from each study presented in this manuscript are also available in the supplemental materials.

admiration and vulnerability (Study 3), but not narcissistic rivalry. Thus, it may be that the attention-seeking behaviors associated with antagonism are most strongly related to narcissism.

More callous and antisocial features of antagonism, such as lack of empathy (e.g., "It's no big deal if I hurt other people's feelings") and manipulativeness (e.g., "I use people to get what I want") also showed divergent relationships. For example, these items were strongly related to psychopathy (main exploratory analyses), with lack of empathy strongly associated with Machiavellianism and callous affect in the supplemental network for Study 4. Indeed, lack of empathy is in line with historical conceptualizations of psychopathy (Hare & Neumann, 2008) and Machiavellianism (Christie, 1970).

Regarding psychoticism, a highly central node in the exploratory analyses was "my thoughts often don't make sense to others." However, there were few connections among dark personality features and individual psychoticism items. The items comprising the psychoticism subscale were strongly interrelated in each network and were mostly related to other pathological personality traits instead of dark personality features. Thus, psychoticism's influence is likely specious in the context of these networks, given that its high expected influence centrality metrics appear to be inflated by the strong connections between individual items and their relationships with other pathological personality traits (e.g., detachment and disinhibition) both at the trait- and item-level analyses.

Notwithstanding these findings, there was considerable variation across studies in both the main and exploratory analyses. For example, whereas disinhibition was positively related to psychopathy in Study 1, it was negatively related to psychopathy in Study 2. Indeed, there was little consistency in the combined nodes across networks in both the main and exploratory analyses. However, this is likely a function of the networks themselves and the interrelationships among individual nodes. For example, consider the combined node of CAST and SRPS Callous Affect in Study 4. Both individual subscales are correlated at .66, but CAST and SRPS Interpersonal Manipulation are also highly correlated ($r = .61$). However, CAST and Callous Affect share similar patterns of correlations with other variables, such as Machiavellianism. Thus, the goldbricker function identifies overlapping or redundant nodes on this basis (P. J. Jones, 2019), with the final network constructed with *EBICglasso* regularization to ensure a greater degree of specificity (and thus lowering the possibility of spurious edges).

Limitations and Conclusions

While we have provided an increasingly more detailed and defensible series of network analyses, our participants were classically W.E.I.R.D. (i.e., Western, educated, industrialized, rich, and democratic; Henrich et al., 2010) in nature. All our samples were American and were either university students or online community members. In principle, this limits our results to a small portion of the human population so it would be beneficial for future studies concerning this topic to include a more diverse array of participants. Careful consideration should be given to the roles that social desirability and other cultural factors may play in the connections between dark personality features and pathological personality traits.

Another limitation was the strong overlap between dark and pathological personality constructs as evidenced by their zero-order correlations (see the supplemental materials for an overview of these correlations between variables for each main network presented in this manuscript). For example, Machiavellianism and Antagonism were moderately correlated in Study 1 ($r = .52$, $p < .001$). In addition, SD3 Narcissism and NARQ Rivalry were modestly correlated in Study 3 ($r = .36$, $p < .001$), although the main network analysis in this study suggested a divergent association between narcissistic admiration and SD3 narcissism, as there was no connection between narcissistic rivalry and SD3 narcissism. Recent criticisms of multivariate approaches to Dark Triad studies have emphasized the limitations of "partialing" such variables when zero-order correlations are moderate-to-large (e.g., less reliable variance and increased Type I error rates; Miller et al., 2019).

However, network theories or hypotheses are often based on the Gaussian graphical model, which is a specific type of pairwise Markov random field (PMRF). PMRFs are beneficial in that their assessment depends on relatively weak assumptions regarding the data-generating process, and by modeling partial correlations, they approach conditional independence (i.e., two unconnected variables are unrelated given the rest of the network; Epskamp et al., 2018). Further, these psychometric models do not rely on latent variables, nor do they have strict assumptions regarding directional pathways (as in a directed acyclic graph, or DAG). Thus, the GGM is an ideal structure for network theory, as this estimated model can be used to isolate and evaluate the influence of specific features (via centrality analysis).

Notwithstanding the benefits of the GGM for network theory and conceptualizing dark and pathological personality facets as a complex system, we wish to emphasize that the conclusions afforded by such models are relatively limited. That is, the models presented in this paper are *hypothesis-generating structures* and are in no way a definite estimation of an underlying causal model. Instead, the structure of the GGM is one of many sources of information that can be used to support a network theory, and future research may thus benefit from modeling temporal networks based on longitudinal data, which detail further information such as dynamic relationships and directionality (e.g., feedback loops) between individual nodes.

Another possible limitation is that the sample sizes for some of our analyses were modest (e.g., $N = 266$ in Study 2). Although there are no firm guidelines regarding appropriate sample size to node or edge weight ratios, we encourage further replication of the networks presented in these studies, ideally with larger sample sizes. In addition, one promising tool is the "netSimulator" function in the *bootnet* package, which allows one to approximate a power analysis based on varying simulations for different sample sizes (e.g., 100, 250, 500, or 1000), given an adjacency matrix (i.e., from an already constructed network). Thus, future studies can use the parameters from the networks presented here to determine sample sizes that may further increase sensitivity and specificity of edge weight detection.

Further, although we implemented procedures to help ensure valid data were collected from our samples (e.g., only including MTurk participants from unique IP addresses), we cannot rule out the possibility of potential misuse of virtual private networks (VPNs) by those included in these samples. Fortunately, recent reviews and guidelines have been put forward to increase the quality of data collected via MTurk (e.g., Ghosh et al., 2019). Nonetheless, we continue to encourage replication of these analyses, in line with our caveat regarding the W.E.I.R.D. characteristics of these samples.

Lastly, replicability itself is an increasingly important consideration for network studies, with a handful of recent studies addressing this issue empirically (e.g., Fried et al., 2016). Many of these studies focus on the replicability of *network structures* comprised of the same nodes, and whether such structures differ depending on sample. Therefore, the four studies presented here did not replicate per se, as having the same nodes and measures across all networks would have provided the best index of network replicability. In line with recent criticisms of and recommendations for improving Dark Triad research (Miller et al., 2019), we were interested in the relationship between pathological personality traits and different conceptualizations of dark personality features, including assessing whether assumed trait-level constructs held together at the level of individual items that constitute those constructs. Thus, different measures of dark personality features were used to examine possible divergent associations between these measures and pathological personality traits, in line with recent network analyses emphasizing the use of different dark personality measures (Dinić et al., 2020). However, the PID-5-BF was used across all four studies, and antagonism was a consistently highly central node throughout these studies, providing compound evidence for both its replicability and generalizability. Future research should continue to examine the role of antagonism in dark personality networks (such as in clinical samples).[5]

In conclusion, antagonism is a key pathological personality trait that is closely associated with the darker aspects of personality (i.e., the Dark Triad, sadism, and spitefulness). Although psychoticism was also highly central, it was more closely related to other pathological personality traits (e.g., disinhibition). Antagonism has been previously implicated as a core component of dark personality features, with the set of studies presented here suggesting that antagonism may be highly influential when conceptualizing these features as a complex system. Further, these studies were able to provide more fine-grained analyses of antagonism by examining specific components of this construct (e.g., antisocial versus attention-seeking behaviors) and their associations with specific dark personality features. As such, these individual item analyses suggest that conceptualizing antagonism as a higher-order factorial trait may result in a lack of specificity. Thus, the specific components of trait antagonism itself warrant further investigation, given the unique connections that emerged in the exploratory analyses. Future research may seek to continue examining these specific components of antagonism and how they relate to other measures of dark personality features.

[5] See Supplemental Tables 1–4 for an overview of mean scores of the scales used in each study. The mean scores for the SD3 subscales, for example, are comparable to other undergraduate and non-clinical samples (e.g., D. N. Jones & Paulhus, 2014).

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