Article

Modeling Relations Between Triarchic Biobehavioral Traits and *DSM* Internalizing Disorder Dimensions

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Abstract

The biobehavioral traits of the triarchic model of psychopathy have well-known correlates with externalizing psychopathology. Although evidence also suggests associations with internalizing disorders, research has yet to formally model relationships between dimensions of internalizing psychopathology and triarchic traits. Employing a sample of 218 adults (50.2% female), the current study used confirmatory factor analysis to characterize how triarchic trait dimensions—delineated using different scale operationalizations—relate to internalizing when modeled as a single broad factor, and as distinct fear and distress subfactors. Findings demonstrated (a) robust opposing relations for triarchic boldness (+) and disinhibition (−), and an interactive association for the two, with general internalizing, along with a modest negative relationship for meanness; and (b) distinct associations for the three triarchic trait dimensions with fear and distress subfactors of internalizing. This work clarifies how facets of psychopathy relate to the internalizing psychopathology spectrum and provides a means for interfacing this spectrum with biological variables.

Keywords

psychopathy, internalizing psychopathology, fear disorders, distress disorders

The triarchic model of psychopathy encompasses three distinct but intersecting trait dimensions, namely *boldness, meanness*, and *disinhibition* (Patrick & Drislane, 2015; Patrick, Fowles, & Krueger, 2009). Although originally advanced as a framework for understanding core dimensions of psychopathic personality and their relations with neural systems and biobehavioral measures, a growing body of research (see, e.g., Nelson, Strickland, Krueger, Arbisi, & Patrick, 2016; Patrick, Durbin, & Moser, 2012; Patrick et al., 2013; Venables et al., 2017) indicates these trait dimensions relate to many different clinical and personality disorders as defined in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association, 2013). Considered in this light, triarchic dimensions can serve as important transdiagnostic phenotypes for use in studies exploring processes underlying mental illness—in particular, studies seeking to clarify the role of biobehavioral trait processes in psychopathology (Patrick, Iacono, & Venables, 2019; see also Patrick & Hajcak, 2016).

To date, these traits have most commonly been examined in relation to externalizing conditions including psychopathy, antisocial personality, and substance addictions (Patrick & Drislane, 2015), although a small number of studies of psychopathy in criminal offenders have demonstrated contrasting associations for affective–interpersonal and impulsive–antisocial symptom dimensions with anxious–depressive problems (e.g., Blonigen et al., 2010; Hicks & Patrick, 2006). Complementing this work on criminal psychopathy, recent studies have shown that psychopathy facets defined in triarchic model terms account for appreciable variance in internalizing forms of psychopathology in nonoffender samples (e.g., Brislin et al., 2017; Nelson et al., 2016). However, most work of this kind to date has examined associations for the triarchic traits with symptoms of individual internalizing conditions (e.g., social phobia, generalized anxiety disorder [GAD], major depressive disorder [MDD]). The one notable exception is a study by Latzman et al. (2019) that investigated relations of the triarchic traits with a general factor of internalizing psychopathology reflecting the covariance among various facets of anxious and depressive symptomatology (Kendler,

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Prescott, Myers, & Neale, 2003; Kotov et al., 2017; Krueger et al., 2018; Watson, 2005). However, this study was limited in that it used only a single scale measure of the triarchic traits and assessed internalizing symptoms using self- and informant-report inventories. Furthermore, delineation of distinct fear and distress subdimensions (Watson, 2005) revealed by structural modeling studies of *DSM*-defined internalizing disorders (e.g., Kendler et al., 2003; Krueger, 1999; Krueger & Markon, 2006) were not considered.

The current study extended prior work by quantifying internalizing symptomatology using an established interview protocol for *DSM* disorders and collecting multiple questionnaire-scale measures of the triarchic biobehavioral traits. This allowed us to model internalizing psychopathology in terms of fear and distress subfactors, which appear distinct in terms of their neurobehavioral bases (Venables et al., 2017), and examine their relations with latent variable representations of the triarchic traits, which allows findings to be generalized across different available measures of these traits (see Drislane & Patrick, 2017; Patrick et al., 2019).

Triarchic Trait Dimensions

The triarchic model conceptualizes psychopathy in terms of three phenotypic-dispositional constructs with direct neurobiological referents: *boldness, meanness*, and *disinhibition* (Patrick et al., 2009). Indeed, the triarchic model constructs were "bootstrapped" (Cronbach & Meehl, 1955) in part from research demonstrating distinct neurophysiological correlates of each (e.g., Dvorak-Bertsch, Curtin, Rubinstein, & Newman, 2009; Marsh et al., 2008; Patrick et al., 2006). *Boldness* entails social dominance, venturesomeness, and an emotional resilience to stressors, and is thought to reflect individual differences in sensitivity or responsiveness of the neural defensive system (i.e., amygdala and related limbic structures). Consistent with this conceptualization, boldness has been shown to relate in various studies to deficient fear-potentiated startle under conditions of aversive cuing (e.g., Benning, Patrick, & Iacono, 2005; Dvorak-Bertsch et al., 2009; Esteller, Poy, & Moltó, 2016; Vaidyanathan, Patrick, & Bernat, 2009). *Meanness* is described as involving a callous disregard for others, aggressive resource seeking, and an inability to form close personal attachments. It is conceptualized as agentic disaffiliation, a motivational orientation in which pleasure and satisfaction are actively sought without regard for and at the expense of others (Patrick et al., 2009). Meanness (also termed *callous–unemotionality*; Frick & Marsee, 2018) is reliably associated with impaired recognition of and neural reactivity to fearful faces (e.g., Brislin et al., 2017; Marsh & Blair, 2008; Marsh et al., 2008) and with various self-report and task-behavioral measures of empathy (e.g., Brislin et al., 2017; Drislane, Patrick, & Arsal, 2014; Foell & Patrick, 2018). The third triarchic trait dimension, *disinhibition*, reflects impulsive–externalizing proclivities including deficient control over urges, difficulty delaying gratification, low frustration tolerance, and deficient emotion regulation. This dimension is theorized to relate to impairments in anterior brain systems governing behavioral restraint and affect regulation in situations calling for "top–down" control (Patrick et al., 2012). As such, neurobehavioral correlates of disinhibition such as reduced P3 brain response and impaired performance on executive-control tasks (Venables et al., 2018; Young et al., 2009) provide evidence of variations in frontal brain function as playing a key role in this dispositional dimension. Importantly, within this model boldness and disinhibition are conceptualized as largely orthogonal and empirical evidence demonstrates they have differing biological and behavioral correlates (Patrick & Drislane, 2015).

Though originally developed as a means for understanding and more clearly quantifying the core components of psychopathic personality, these biobehavioral dimensional traits demonstrate robust associations with various other forms of psychopathology—whether quantified via self-report (Nelson et al., 2016; Patrick et al., 2012) or through combined use of self-report and neurophysiological indicators (Venables et al., 2017). Considered in this way, the triarchic model dimensions represent important transdiagnostic phenotypes that can be used in studies exploring processes underlying broad spectra of mental illness.

With regard to associations with different forms of psychopathology, boldness (quantified in some cases in reverse, as threat sensitivity) and weak inhibitory control (corresponding to the triarchic trait of disinhibition) have been linked to internalizing and externalizing disorder symptoms. For example, within a college student sample, Brislin et al. (2017) found consistent negative relations for boldness with self-report measures of fearfulness and anxiety, whereas disinhibition did not correlate consistently with fearfulness but showed a positive association with anxious distress. Furthermore, within a male offender substance treatment sample, these authors found that boldness was associated to a strong negative degree with social anxiety, and to a more moderate negative degree with reported depressivity/dysphoria. More recently, in two separate samples, one utilizing self-report and the other informant-report assessments, Latzman et al. (2019) found a similar pattern of associations across samples. That is, boldness evidenced clear negative associations with general depression, dysphoria, and social anxiety, to a similar degree in the self-report sample, and to an even stronger degree in the informant-report sample. However, in contrast with Brislin et al., boldness in these two samples showed stronger relations with depression and dysphoria than with social anxiety. A possible reason for this may be that the report-based

symptom inventory used by Latzman et al., the Inventory of Depression and Anxiety Symptoms (Watson et al., 2007), includes much more extensive coverage of depressive/dysphoric features than social anxiety symptoms. Pertinent to this issue, another study by Nelson et al. (2016) that utilized structured interview assessments of *DSM* psychopathology found that high threat sensitivity (/low boldness) was strongly predictive of fear disorder symptomatology and only weakly predictive of distress disorder symptoms, whereas the reverse pattern was evident for weak inhibitory control (/disinhibition). Studies that have examined correlations for the third triarchic dimension, meanness, have found weaker and less consistent associations (negative in some cases, positive in others) with internalizing psychopathology measures (Patrick & Drislane, 2015).

In summary, findings from available studies converge to indicate that boldness relates robustly and negatively to fear-related outcomes, particularly phobic-avoidant fear, and more modestly with distress-related symptomatology such as depression/dysphoria and anxiousness. Disinhibition relates robustly and positively to anxiousness/distress and more modestly with fear symptomatology. Finally, although meanness exhibits modest positive associations with some fear-disorder symptoms such as social phobia and some distress-disorder symptoms such as general depression, this appears to be largely attributable to its overlap with disinhibition (Latzman et al, 2019; Patrick & Drislane, 2015). This pattern of results is interesting to consider from the standpoint of the triarchic constructs as core biobehavioral traits. For example, the finding of robust negative associations for boldness with fear-related symptomatology appears consistent with the idea of this trait being rooted in neural threat sensitivity. On the other hand, the finding of positive associations for disinhibition with distress-related symptomatology appears consistent with the idea of this trait being rooted in frontal-regulatory dysfunction (e.g., Young et al., 2016). Potentially in part because of its overlap with disinhibition and, to a lesser extent, boldness, findings for meanness are somewhat more difficult to interpret, but appear to be consistent with the concept of meanness as involving elements of social disaffiliation and emotional insensitivity (Drislane & Patrick, 2017).

Although prior studies in this area have yielded important foundational data, a number of limitations are evident in the current published literature that need to be addressed to further clarify how the triarchic model traits—as transdiagnostic biobehavioral dimensions—relate to internalizing forms of symptomatology. Importantly, all previous studies have quantified the triarchic trait constructs using single sets of manifest scales—although multiple scale measures of these constructs have been developed (for a review, see Patrick & Drislane, 2015; see also Drislane et al., in press; Drislane, Jones, Brislin, & Patrick, 2018; Sellbom et al., 2016). The availability of alternative scale operationalizations allows for boldness, meanness, and disinhibition to be modeled as latent variables—thereby removing instrument-specific measurement error and enabling findings to be interpreted in terms of constructs rather than specific measures (Drislane & Patrick, 2017).

Another limitation of existing work pertains to the assessment of internalizing psychopathology: Only Nelson et al. (2016) formally assessed for anxious–depressive symptomatology using a structured diagnostic interview protocol. However, this study quantified boldness indirectly and in reverse (as threat sensitivity), and did not assess for meanness. Latzman et al. (2019) quantified internalizing psychopathology in a dimensional, factor-analytic manner, but these authors employed a self-report symptom inventory and did not separately model fear and distress subdimensions of internalizing. Given that interview-based evaluation is the norm in clinical settings, follow-up work is needed using this mode of symptom assessment to establish the applied significance of Latzman et al.'s (2019) findings. Additionally, as described next, modeling internalizing psychopathology in terms of fear and distress subfactors is critical for a clearer understanding of how triarchic biobehavioral traits relate to the internalizing spectrum of psychopathology (see, e.g., Nelson et al., 2016; Patrick et al., 2019; Venables et al., 2017).

Internalizing Psychopathology Spectrum. Factor analytic studies of common mental disorders (e.g., Kendler et al., 2003; Krueger, 1999; Slade & Watson, 2006; Vollebergh et al., 2001; Watson, 2005) have revealed two broad, higher-order dimensions of psychopathology: externalizing (e.g., substance use disorders and antisocial behaviors), the most commonly studied dimension with regard to psychopathy, and internalizing (e.g., mood and anxiety disorders). For internalizing disorders, Krueger (1999; Krueger & Markon, 2006) demonstrated a bifurcated organization, wherein a higher-order internalizing dimension (interpretable as broad negative affectivity; e.g., Clark & Watson, 1991; Mineka, Watson, & Clark, 1998) subsumed two correlated but distinguishable lower order factors—one encompassing phobic fear disorders (i.e., social and specific phobia, agoraphobia, panic disorder) and the other anxious–dysphoric (distress) disorders (i.e., major depression, dysthymic disorder, GAD, posttraumatic stress disorder [PTSD]).

Examination of relations between the triarchic model constructs and this bifurcated model of the internalizing spectrum would allow for specification of unique and overlapping associations of core biobehavioral traits with dimensions of the internalizing psychopathology spectrum. Work of this kind is particularly timely and valuable given the recent formulation of a comprehensive dimensional model for mental disorders, the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017; Krueger et al., 2018), which represents internalizing psychopathology in this bifurcated

dimensional manner. Importantly, HiTOP provides an evidence-based alternative to traditional categorical approaches to classification and holds considerable promise for integrative applied clinical research and practice (Hopwood et al., in press).

Current Study. Although there appears to be strong support for the notion that the triarchic biobehavioral traits are associated with internalizing-related forms of psychopathology, research has yet to examine associations between the triarchic dimensions and factor-analytically specified dimensions of internalizing psychopathology within a joint structural model. With this gap in the literature in mind, the current work was undertaken to examine the way in which triarchic trait dimensions, modeled using different self-report scale operationalizations as indicators, relate to general internalizing psychopathology, as well as to fear and distress subfactors, within an integrative structural model of internalizing psychopathology, specified using standardized diagnostic interview-based symptom counts. Doing so is important because it can provide a means for interfacing a new, comprehensive hierarchical–dimensional model of adult psychopathology (Kotov et al., 2017; Krueger et al., 2018) with the nomological networks of the triarchic model constructs—which include replicable neurophysiological and behavioral indicants (for reviews, see Patrick & Drislane, 2015; Patrick et al., 2019).

Based on previous findings using questionnaire-based assessment of internalizing symptomatology (Latzman et al., 2019), we predicted that latent internalizing would relate negatively to boldness and positively to disinhibition. Specific hypotheses were not advanced for meanness due to above-noted inconsistencies in findings for this triarchic trait, and uncertainty as to its unique associations given its overlap with disinhibition. We further predicted that the association between disinhibition and internalizing would be moderated by boldness, such that high boldness would attenuate the positive association between disinhibition and internalizing (Patrick, 2018).

Regarding fear and distress subdimensions of internalizing, we predicted—based on prior empirical and theoretical work (e.g., Brislin et al., 2017; Hicks & Patrick, 2006, Patrick et al., 2009; Patrick, 2010)—that boldness and disinhibition in particular would exhibit distinct associations with these subdimensions. Boldness was expected to show negative relations with both distress and fear subdimensions, though stronger with fear, based on conceptualizations of boldness as involving fearlessness and immunity to stressful experience (e.g., Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Fowles, 1980; Lilienfeld & Widows, 2005; Lykken, 1957, 1995; Patrick et al., 2009, Patrick, 2010; see also Cleckley, 1976; Crego & Widiger, 2016) rooted in low neural defensive reactivity (Patrick et al., 2009). Disinhibition, based on its presumed basis in neuroregulatory dysfunction (Patrick et al., 2009) and its positive relations with various scale measures of negative emotionality (Drislane et al., 2014; Sellbom & Phillips, 2013), was expected to show positive associations with both distress and fear subdimensions of internalizing, though relatively stronger with distress than fear. Our hypothesis regarding the relatively stronger association with distress than fear is further based on prior findings of positive associations for disinhibition with sensation seeking, a trait associated with lower levels of reported fear (Sylvers, Lilienfeld, & LaPrairie, 2011), but positive associations with symptoms of anxiety and depression (e.g., Benning et al., 2005; Hicks & Patrick, 2006). Specific hypotheses were not advanced for meanness given inconsistencies in prior findings for this trait (e.g., Drislane et al., 2014; Poy, Segarra, Esteller, López, & Moltó, 2014; Sellbom & Phillips, 2013) as discussed above.

Finally, existing theoretical (e.g., Drislane et al., 2014; Patrick, 2018; Patrick & Bernat, 2009; Smith, Edens, & McDermott, 2013) and empirical (e.g., Hicks & Patrick, 2006; Latzman et al., 2019; Sellbom, 2015; Venables et al., 2015) writings suggest the possibility that the presence of boldness may attenuate positive associations of disinhibition with negative emotional experience and symptomatology. Given the documented positive (~.5) relationship between disinhibition and meanness, boldness might also be expected to attenuate any corresponding associations for meanness. These interactions were further undertaken to test, partially, the theorized compound nature of these orthogonal triarchic traits (Lilienfeld et al., 2012; Lilienfeld et al., in press). Accordingly, we tested for moderating (interactive) effects of boldness on associations between disinhibition and internalizing symptomatology, and between meanness and internalizing symptomatology.

Method

Participants

Study participants were 218 adults (18-47 years old; M_{age} = 20.8 ± 4.2; 50.2% female), consisting of undergraduates from a large southern public U.S. university along with adults from the surrounding community, recruited through campus advertisements and Craigslist advertisements. For purposes of prescreening, candidates for participation were administered the Disinhibition and Boldness scales of the Triarchic Psychopathy Measure (TriPM; Patrick, 2010). Individuals in the highest and lowest quartiles of the distribution of scores on these trait dimensions were prioritized for inclusion in the study sample, with representation also of individuals in the midrange (25% to 75%) of scores. This approach ensured effective representation of the full range of scores on each of these triarchic traits as well as appreciable rates of psychopathology in the study sample. Given expected regression to the

mean on retesting, this recruitment strategy yielded near-normal distributions of scores for both TriPM Boldness (skewness = −0.255) and Disinhibition (skewness = 1.373)—and Meanness as well (skewness = 0.804), given its moderate-level (~.5) association with TriPM Disinhibition—obviating the need for score transformations to correct for nonnormality.

Interview data as described below were collected from participants via in-person face-to-face interviews, and self-report measures were collected either electronically or via paper-and-pencil forms. Seventeen participants were missing self-report data, resulting in a reduced sample of 201 for those analyses. All study procedures were approved by the University's institutional review board.

Measures

Triarchic Dispositional Dimensions. The triarchic dimensions were assessed via three different questionnaire-scale assessments of these dispositional constructs: the TriPM subscales (Patrick, 2010), and triarchic scales composed of relevant items from the Multidimensional Personality Questionnaire (Brislin, Drislane, Smith, Edens, & Patrick, 2015), and the Personality Inventory for DSM-5 (Drislane et al., in press).

Triarchic Psychopathy Measure (Patrick, 2010). The TriPM is a 58-item questionnaire inventory developed specifically to assess the biobehavioral traits of the triarchic model. Each item is answered using a 4-point response format: *true* (T), *somewhat true* (t), *somewhat false* (f), and *false* (F). There is no timeframe for the items comprising the three scales—Boldness, Meanness, and Disinhibition—resulting in trait-like assessments rather than state-like assessments. Consistent with prior work reporting good internal consistencies in both forensic and community samples (e.g., Sellbom & Phillips, 2013); Cronbach's alphas in the current study sample were .88 for Boldness, .87 for Meanness, and .86 for Disinhibition. Moreover, published research has demonstrated convergent and discriminant validity for the TriPM scales in relation to a wide array of criterion measures, including other widely used self- and informant-report psychopathy measures (e.g., Drislane et al., 2014; Sellbom & Phillips, 2013; Venables, Hall, & Patrick, 2014).

Multidimensional Personality Questionnaire–Triarchic Scales (MPQ-Tri; Brislin et al., 2015). The MPQ-Tri scales provide for assessment of the triarchic dimensions using content relevant items from the Multidimensional Personality Inventory (MPQ; Patrick et al., 2002; Tellegen, 1982). The MPQ contains trait-like single-statement items that are answered using a 2-point, true/false response format. MPQ-Tri scales were created using a consensus rating and internal refinement approach (Brislin et al., 2015) employed in prior work to develop triarchic scales from other item sets (Drislane et al., 2014; Hall et al., 2014). Items comprising the MPQ-based Boldness scale are taken mainly from the Social Potency, Harm Avoidance, and Stress Reaction trait scales of the MPQ, with lesser representation of items from the Well-being, Achievement, and Control scales. The MPQ Meanness scale is composed mainly of items from the MPQ Aggression and Social Closeness scales. Items for MPQ Disinhibition are mostly from the MPQ's Control and Alienation scales, with some representation of items from the Stress Reaction and Aggression scales.

Internal consistencies (α) for the MPQ-Tri scales in prior work have ranged from .75 to .80 in community participants, and from .70 to .83 in incarcerated participants (Brislin et al., 2015); αs in the current sample were .79 for Boldness, .75 for Meanness, and .79 for Disinhibition. With respect to validity, prior research has shown strong convergence for the MPQ-Tri scales with their TriPM counterparts (Brislin et al., 2015), and expected differential relations with factors of the PCL-R and the symptom criteria for antisocial personality disorder (Brislin et al., 2017). Prior studies (Brislin et al., 2015; Brislin et al., 2017) have also reported expected associations for the MPQ-Tri scales with depression and anxiety as indexed by the Beck Depression Inventory (BDI-II: Beck, Steer, & Brown, 1996) and the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and dispositional fear as indexed by the Trait Fear inventory (Kramer et al., 2019).

Personality Inventory for DSM-5 Triarchic Scales (PID-Tri; Drislane et al., in press). The PID-Tri scales assess the triarchic dimensions using items from the Personality Inventory for *DSM-5* (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012). The PID-5 consists of items that may describe an individual, answered on a 4-point scale: *very false or often false* (0), *sometimes or somewhat false* (1), *sometimes or somewhat true* (2), *very true or often true* (3). The PID-Tri scales were created using the same consensus rating and internal refinement approach used to develop the MPQ-Tri scales, and each includes representation of negatively worded as well as positively worded items (Drislane et al., in press). Items comprising the PID-Tri Boldness scale are taken largely from the Attention Seeking, Anxiousness, Risk-Taking, Manipulativeness, and Submissiveness scales, with a lesser representation of the Grandiosity, Anhedonia, and Withdrawal scales. The PID-based Meanness scale includes representation of items mainly from the PID-5 Callousness and Restricted Affectivity scales, with additional representation from the Grandiosity, Intimacy Avoidance, Withdrawal, Hostility and Emotional Lability scales. The Disinhibition scale is primarily composed of items from the PID-5 Irresponsibility and Impulsivity scales, with supplementary items from the Hostility, Suspiciousness, Deceitfulness, and Risk-Taking scales. All three

PID-Tri scales have been found to exhibit strong convergent validity with their counterpart TriPM scales, with PID-Tri Meanness and Disinhibition scales providing effective coverage of antisocial personality disorder symptom criteria (Drislane et al., in press; see also Strickland, Drislane, Lucy, Krueger, & Patrick, 2013). Internal consistencies (Cronbach's alphas) for the PID-Tri scales in the current sample were: .70 for Boldness, .90 for Meanness, and .89 for Disinhibition.

Internalizing Psychopathology

Structured clinical interview for the DSM-IV *Axis I disorders (SCID-I; First, Spitzter, Gibbon, & Williams, 2002).* All participants were assessed for the full range of *DSM-IV* anxiety and distress disorders using the SCID-I. Each participant was interviewed by a PhD-level clinical psychologist or advanced clinical psychology graduate student trained in administration and scoring of the SCID-I diagnostic interview. Interviewers had no knowledge of other assessment data collected from interviewees. Symptom ratings reflecting maximum lifetime experience of symptomatology for each disorder were assigned through a consensus process entailing meetings attended by the interviewers, along with the project PI who provided consultation on ratings and diagnostic decisions. This approach to assignment of diagnostic ratings has proven effective (in terms of yielding theory-consistent relations with criterion measures) in prior published research (e.g., Iacono, Carlson, Taylor, Elkins, & McGue, 1999; Nelson et al., 2016; Venables et al., 2017).

Internalizing psychopathology was modeled dimensionally in two ways: (a) as a broad factor encompassing both fear and distress disorder symptoms, and (b) in terms of distinct but correlated fear and distress subfactors. Based on structural models of internalizing psychopathology reported by Krueger (1999) and others (e.g., Krueger & Markon, 2006; Watson, 2005), lifetime symptom counts for eight *DSM* disorders—specific phobia, social phobia, agoraphobia, panic disorder, MDD, dysthymia, PTSD, and GAD—were utilized as indicators in the single broad-factor model. For the two distinct-subfactors model, four fear disorders (specific phobia, social phobia, agoraphobia, panic disorder) and three distress disorders (MDD, dysthymia, PTSD) were utilized as indicators. GAD was not included as an indicator in this model because it correlated similarly with fear disorder symptom scores (Mean $r = .31$) as with distress disorder symptoms (Mean $r = .37$) and thus did not operate as a distinct indicator of one subdimension versus the other. This finding coincides with other reports of GAD being more strongly associated with broad internalizing psychopathology than with a dysphoria/distress-specific factor (e.g., Lahey, Van Hulle, Singh, Waldman, & Rathouz, 2011; Lahey & Waldman, 2012).[1]

Of the 209 study participants with SCID interview data, 50.9% exhibited one or more symptoms of a fear disorder and 47.3% exhibited one or more symptoms of a distress disorder. Furthermore, 34 participants (16.2%) met for at least one fear disorder (specific phobia, $n = 8$; social phobia, $n = 17$; agoraphobia $n = 2$; panic disorder, $n = 7$), and 84 participants (40.3%) met for at least one distress disorder (MDD, $n = 45$; dysthymia, $n = 11$; GAD, $n = 19$; PTSD, $n = 9$).

Data Analyses

Bivariate correlations were first computed among the triarchic dimensions as assessed by the different self-report triarchic scales, and between the triarchic scales and symptoms of each of the SCID-I fear and distress disorders. To evaluate associations for the unique variance in each triarchic dimension (when controlling for overlap with the others), partial correlations were also computed for each triarchic scale set (TriPM, MPQ-Tri, PID-5-Tri). To investigate associations with a single internalizing factor as reported in previous work (Latzman et al., 2019) and as described above, a structural model was fitted in which internalizing was estimated using all of the SCID-I internalizing-disorder symptom scores as indicators. Then, consistent with a recent structural-modeling analysis (Drislane & Patrick, 2017), the three scale measures available for each triarchic dimension were used as indicators to model these three dimensions as latent factors, using maximum likelihood estimation in the M*plus* statistical package (version 7.4; Muthén & Muthén, 1998-2015). Next, two latent internalizing factors, fear and distress, were modeled as described above using SCID-I fear and distress disorders as indicators—in line with prior work by Krueger et al. (Krueger, 1999; Krueger & Markon, 2006) and others (e.g., Lahey et al., 2011). Specifically, as described above, the fear disorder factor was indicated by specific phobia, social phobia, panic disorder, and agoraphobia; the distress disorder factor was demarcated by MDD, dysthymia, and PTSD.

For each of these models (triarchic psychopathy dimensions, internalizing disorder dimensions), goodness-of-fit indices—namely, likelihood ratio χ^2, root mean square error of approximation (RMSEA), and comparative fit index (CFI)—were examined to confirm adequate model fit before specifying a joint structural equation model (SEM) in which latent internalizing psychopathology factors were regressed onto latent dimensions of triarchic psychopathy. Lower values of RMSEA ($<.08$) and χ^2 ($p < .05$) and higher values of CFI ($>.90$) indicate a better-fitting model (Chen, 2007).

Given growing interest in examining interactive effects for boldness with the other two triarchic dimensions (e.g., Latzman et al., 2019; Lilienfeld et al., in press; Sellbom, 2015; Venables et al., 2015), as described above, we also tested for moderating effects of boldness on associations of disinhibition and meanness with internalizing psychopathology. Specifically, we included latent interaction terms (i.e., boldness $\times$ meanness, boldness $\times$ disinhibition),

Table 1. Bivariate correlations among triarchic scales.

		Boldness			Meanness			Disinhibition		
		TriPM	MPQ	PID-5	TriPM	MPQ	PID-5	TriPM	MPQ	PID-5
Boldness	TriPM	1.0	**.80**	**.80**	**.20**	.10	*.15*	.03	.05	.11
	MPQ	—	1.0	**.75**	**.23**	.06	*.14*	.09	.11	.11
	PID-5	—	—	1.0	**.21**	.01	*.16*	*.16*	.06	*.15*
Meanness	TriPM	—	—	—	1.0	**.64**	**.69**	**.43**	**.29**	**.42**
	MPQ	—	—	—	—	1.0	**.62**	**.33**	**.42**	**.45**
	PID-5	—	—	—	—	—	1.0	**.26**	**.19**	**.49**
Disinhibition	TriPM	—	—	—	—	—	—	1.0	**.61**	**.66**
	MPQ	—	—	—	—	—	—	—	1.0	**.73**
	PID-5	—	—	—	—	—	—	—	—	1.0
Mean		.60	.50	.39	.20	.27	.17	.23	.35	.18
Range		.21-.95	0-1.0	.07-.70	0-.61	0-.81	0-.66	0-.92	0-.94	0-.61

Note. TriPM = Triarchic Psychopathy Measure; MPQ = Multidimensional Personality Questionnaire; PID-5 = Personality Inventory for *DSM-5*. N = 201. Proportion scores were computed for each scale to maintain the mean and range between 0 and 1. Bolded correlations are significant at $p < .01$, and italicized correlations are significant at $p < .05$.

created via the XWITH function in M*plus*, in the full structural model.

Results

Bivariate Correlations

Table 1 shows correlations among the three sets of triarchic scales (TriPM, MPQ, PID-5). A clear convergent-discriminant pattern of associations emerged, with corresponding scales evidencing the clearest and strongest associations with one another. Next, bivariate correlations were used to examine associations between triarchic dimensions as assessed by the different scale measures and symptom scores for individual internalizing disorders (see Table 2). With some minor exceptions, scales indexing boldness generally emerged as negatively associated with fear disorder symptomatology and also GAD symptoms, whereas disinhibition emerged as generally positively associated with distress disorder symptoms and also GAD. Meanness was largely uncorrelated with symptoms of either type of disorder.

Accounting statistically for variance shared among the three triarchic scales in each set using partial correlations, associations with SCID-based symptom scores were largely similar to zero-order correlations, except for notably amplified positive relationships for disinhibition scales with distress-based disorders—especially so the case of TriPM and PID-5 Disinhibition.

Structural Models. As described earlier, the triarchic trait dimensions were modeled as latent variables using the three scale indicators available for each (TriPM, MPQ, PID-5). General internalizing, and fear and distress subdimensions of internalizing, were modeled using SCID-based symptom scores for the various disorders listed in Table 2, as described in the Method section.

Measurement models. Within the triarchic measurement model, all scale-level indicators loaded strongly (range = .78-.92) on their respective factors. Within this model, latent meanness and disinhibition were moderately-to-strongly correlated (r = .50), whereas latent boldness evidenced comparatively weak positive associations with meanness and disinhibition (rs = .21 and .13, respectively, ps $< .01$ and $> .10$). Although the highly conservative chi-square test of model misfit was significant ($p < .01$), the other model fit indices provided evidence of acceptable fit: $\chi^2(22) = 60.17$, $p < .01$; RMSEA = .093; Tucker–Lewis index [TLI] = .944; CFI = .966; standardized root mean square residual [SRMR] = .05.

In the one-factor broad internalizing psychopathology model, all symptom scores loaded significantly onto the single internalizing factor at .36 or higher, with MDD evidencing the strongest loading (.69). Although the chi-square test of model misfit for this model was significant ($p < .01$), the other model fit indices again provided evidence of acceptable fit: $\chi^2(20) = 45.066$, $p < .01$, RMSEA = .076, CFI = .911, TLI = .875, SRMR = .050.

Within the two-factor fear and distress disorder model, all SCID-based symptom scores loaded clearly on their designated factors. For the fear dimension, all symptom count indicators loaded .41 or higher onto this factor, with social anxiety evidencing the strongest loading (.64). With regard to the distress dimension, all symptom count indicators loaded .40 or higher, with MDD evidencing the strongest loading (.84). Within this model, latent fear and distress dimensions correlated at .77. Although the chi-square test of model misfit for this model was significant

Table 2. Bivariate and partial correlations between triarchic scales and internalizing disorder symptom variables.

Internalizing disorder symptom variables	Boldness			Meanness			Disinhibition		
	TriPM	MPQ	PID-5	TriPM	MPQ	PID-5	TriPM	MPQ	PID-5
Fear									
Panic disorder	**−.21 (−.20)**	−.09 (−.10)	**−.23 (−.25)**	.02 (−.02)	.02 (−.03)	−.07 (−.03)	**.19 (.22)**	.13 (.12)	.02 (.07)
Social phobia	**−.35 (−.35)**	**−.35 (−.37)**	**−.41 (−.42)**	.01 (08)	.05 (.03)	−.00 (.09)	.07 (.11)	.07 (.09)	−.00 (.03)
Specific phobia	**−.27 (−.26)**	**−.25 (−.25)**	**−.31 (−.30)**	*−.14* (−.11)	−.02 (−.10)	−.09 (−.06)	−.01 (.07)	*.18* **(.24)**	.06 *(.16)*
Agoraphobia	*−.17* (−.14)	−.12 (−.08)	**−.29 (−.26)**	−.11 (−.10)	.07 (−.05)	−.07(−.03)	.01 (.10)	.06 (.04)	−.03 (−.03)
Distress									
MDD	*−.18 (−.17)*	*−.17* **(−.20)**	*−.16* **(−.20)**	−.02 *(.14)*	.06 (−.11)	−.06 (−.11)	**.32 (.37)**	**.35 (.37)**	**.23 (.29)**
Dysthymia	**−.19** *(−.17)*	−.13 **(−.15)**	**−.22 (−.25)**	.00 (−.07)	.05 (−.06)	.02 (.03)	**.23 (.29)**	**.23 (.25)**	.13 *(.16)*
PTSD	−.07 (−.05)	−.04 (−.07)	−.02 (−.03)	−.04 (−.17)	.09 (−.01)	−.08 *(−.18)*	**.28 (.32)**	**.24 (.23)**	**.16 (.24)**
GAD	**−.33 (−.33)**	**−.20 (−.21)**	**−.35 (−.38)**	−.04 (−.08)	−.00 (−.11)	*−.17 (−.19)*	**.19 (.26)**	**.22 (.24)**	.09 **(.23)**

Note. TriPM = Triarchic Psychopathy Measure; MPQ = Multidimensional Personality Questionnaire; PID-5 = Personality Inventory for *DSM-5*; MDD = major depressive disorder; PTSD = posttraumatic stress disorder; GAD = generalized anxiety disorder. GAD was included as an indicator of broad internalizing psychopathology, but not of fear or distress subdomains of internalizing (see main text for details). $N = 201$ for bivariate correlations, and $N = 193$ for partial correlations (in parentheses); partial correlations control for shared variance among triarchic dimensions. Bolded correlations significant at $p < .01$ and italicized correlations significant at $p < .05$.

($p < .01$), the other model fit indices again provided evidence of acceptable fit: $\chi^2(13) = 28.570$, $p < .01$, RMSEA = .073, CFI = .924, TLI = .877, SRMR = .049.

Joint structural equation model: One-factor internalizing. As described above, to investigate relationships with general internalizing psychopathology in parallel with prior research (Latzman et al., 2019), we fit a structural model in which a single broad internalizing factor was delineated using SCID-based symptom scores as indicators and linked (through model paths) to the latent triarchic factors. This model provided an adequate fit to the data: $\chi^2(111) = 255.774$, $p < .001$, RMSEA = .077, CFI = .905, TLI = .884, SRMR = .070.

Within this model (see Figure 1), boldness and disinhibition evinced similar-level associations with the general internalizing factor, but in opposing directions: Boldness showed a moderate negative association with general internalizing ($\beta = -.46$, 95% CI [−.34, −.57], $p < .001$), whereas disinhibition showed a moderate positive association ($\beta = .48$, 95% CI [.35, .62], $p < .001$). The third triarchic dimension, meanness, evidenced a small negative association with latent internalizing ($\beta = -.18$, 95% CI [−.03, −.33], $p < .05$). When interaction terms for the latent triarchic dimensions were included in the model (i.e., boldness × meanness, boldness × disinhibition), the boldness × disinhibition interaction term emerged as a robust predictor of general internalizing psychopathology ($\beta = -.23$, 95% CI [−.06, −.39], $p < .05$), whereas boldness × meanness did not significantly explain general internalizing ($\beta = .17$, $p > .05$). Probing the boldness × disinhibition interaction-term effect revealed that the positive association between disinhibition and general internalizing was evident among participants scoring low in boldness but absent among individuals scoring high in boldness (see Supplemental Figure 1 available online).

Joint structural equation model: Two-factor internalizing. Next, to investigate distinct associations between triarchic model dimensions and internalizing subfactors, a joint SEM model was specified in which fear and distress were regressed onto the latent triarchic dimensions (see Figure 2). This model showed acceptable fit to the data: $\chi^2(92) = 186.429$, $p < .001$; RMSEA = .069, CFI = .934, TLI = .914, SRMR = .056. As shown in Figure 2, the fear-disorder dimension was related strongly and negatively to latent boldness ($\beta = -.65$, 95% CI [−.52, −.78], $p < .001$) and also weakly (but positively) to disinhibition ($\beta = .21$, 95% CI [.04, .38], $p < .05$). The distress-disorder dimension, on the other hand, correlated most strongly (in a positive direction) with disinhibition ($\beta = .58$, 95% CI [.44, .73], $p < .001$) but also showed weakly-to-moderately *negative* associations with both boldness ($\beta = -.26$, 95% CI [−.13, −.39], $p < .01$) and meanness ($\beta = -.24$, 95% CI [−.08, −.40], $p < .05$).

Finally, when latent boldness × meanness and boldness × disinhibition interaction terms were entered into the model, the boldness × meanness interaction term accounted for significant variance in latent fear ($\beta = .29$, 95% CI [.10, .49], $p < .05$); boldness × disinhibition did not emerge as significant predictor of either fear or distress disorder symptomatology ($\beta < |.22|$, $p > .05$). Probing the significant boldness × meanness interaction revealed that although meanness was not associated with fear, it did evidence a prediction relationship in the context of low boldness. Specifically, among individuals scoring low on boldness, meanness showed a negative association with fear—as opposed to a close-to-null association among individuals high in boldness (see Supplemental Figure 2 available online).

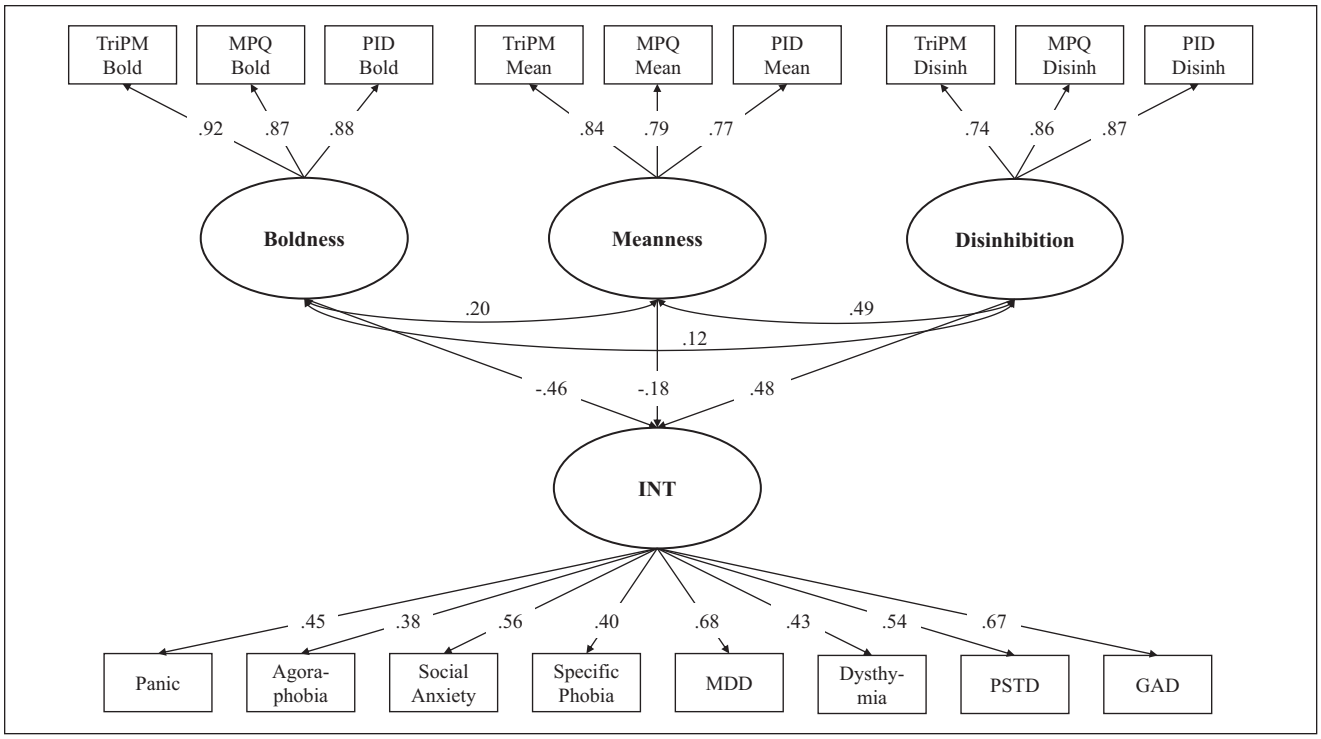

Figure 1. Structural equation model of the dimensions of triarchic psychopathy explaining general internalizing psychopathology.
Note. $N = 218$. TriPM = Triarchic Psychopathy Measure; MPQ = Multidimensional Personality Questionnaire; PID = Personality Inventory for *DSM-5*; MDD = major depressive disorder; PTSD = posttraumatic stress disorder; GAD = generalized anxiety disorder. $\chi^2(20) = 45.066$, $p < .01$, RMSEA = .076, CFI = .911, TLI = .875, SRMR = .050.

Discussion

The current study was undertaken to characterize patterns of associations for the triarchic biobehavioral traits, modeled using different self-report scale operationalizations as indicators, with general internalizing psychopathology, and its distinguishable fear and distress subdimensions, modeled using diagnostic interview-based symptom counts as indicators. These analyses allowed for examination of the relations of the triarchic trait dimensions with general internalizing, as well as with fear and distress subfactors, and provide insight into biobehavioral pathways to internalizing psychopathology as well as how psychopathy interfaces with this important spectrum of psychopathology.

Findings for the general internalizing factor, modeled using SCID-I symptom count data, were highly consistent with previous findings (i.e., Latzman et al., 2019) based on self-report assessed internalizing symptomatology and single manifest measures of each triarchic trait (i.e., subscales of the TriPM). Specifically, within a joint structural analysis, robust negative and positive associations with general internalizing emerged for boldness and disinhibition, respectively, with meanness showing a negative, albeit weak, relationship. In addition, over and above their individual predictive relations, boldness and disinhibition also evidenced an interactive association with general internalizing, such that the positive relationship for disinhibition with internalizing problems as a whole emerged only for participants low in boldness; this interactive relationship paralleled that reported by Latzman et al. (2019), but emerged even more strongly. Overall, the triarchic biobehavioral traits accounted for 40.5% of the overall observed variance in internalizing symptomatology.

Additionally, extending prior work, the availability of standardized SCID-I psychopathology assessments in the current study enabled us to model distinct fear and distress subfactors of internalizing, providing for a more nuanced characterization of relations between the triarchic traits and different manifestations of internalizing psychopathology that may entail different etiologies. In line with results reported by Nelson et al. (2016) for disinhibition and boldness (operationalized in reverse as threat sensitivity), latent boldness in the current study showed its strongest association with the fear subfactor of internalizing ($\beta = -.65$, 95% CI [−.52, −.78]) and evidenced a more moderate association with the distress subfactor ($\beta = -.26$, 95% CI [−.13, −.39]). Latent disinhibition, on the other hand, showed its strongest relationship with distress disorder symptoms ($\beta = .58$, 95% CI [.44, .73]); this association was strikingly similar, but opposite in direction, to the association for boldness with fear

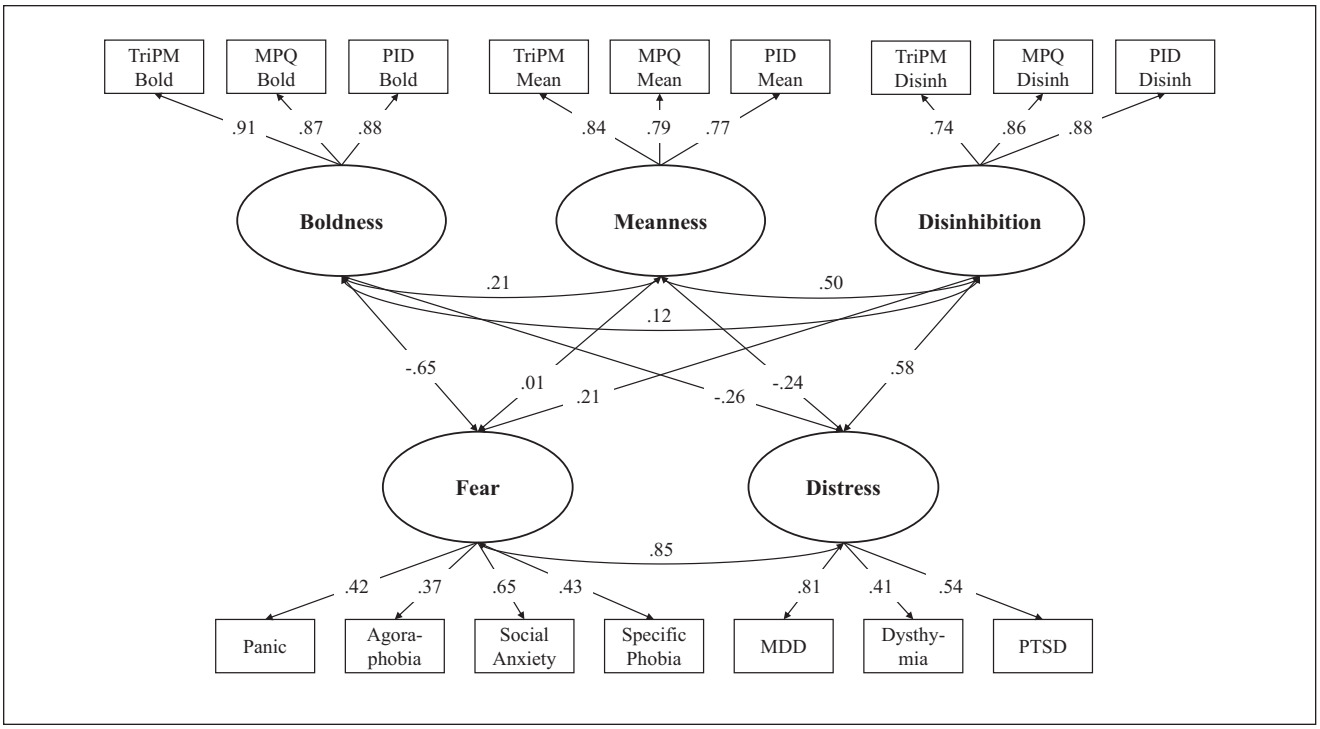

Figure 2. Structural equation model of the dimensions of triarchic psychopathy explaining internalizing psychopathology subdimensions fear and distress.

Note. $N = 218$. TriPM = Triarchic Psychopathy Measure; MPQ = Multidimensional Personality Questionnaire; PID = Personality Inventory for *DSM-5*; MDD = major depressive disorder; PTSD = posttraumatic stress disorder. $\chi^2(92) = 186.429$, $p < .001$, RMSEA = .069, CFI = .934, TLI = .914, SRMR = .056.

symptomatology. Furthermore, disinhibition evidenced only a weak association with fear disorder symptoms (β = .21, 95% CI [.04, .38]). Latent meanness was not associated with fear symptomatology (β = .01, 95% CI [−.17, .18]) but showed a modest significant *negative* association with distress disorder symptoms (β = −.24, 95% CI [−.08, −.40]). Overall, the triarchic biobehavioral traits accounted for 45.6% of the observed variance in fear symptomatology and 50.3% of the observed variance in distress symptomatology.

Modeling fear and distress factors separately is helpful for clarifying the contributions of latent triarchic traits to variance in the two internalizing subfactors. As such, results from this model complement those from the general internalizing model.

Theoretical and Applied-Clinical Implications of Findings From the Two Models

Results of the present study have important implications for theory and also for research-related and applied clinical assessment. With regard to theory, current results have implications both for understanding of general psychopathology and of psychopathy more specifically. In relation to general psychopathology, findings from the broad one-factor internalizing model are consistent with prior evidence (Nelson et al., 2016) indicating that largely independent trait dimensions of threat sensitivity (boldness in the current study) and disinhibition are each robustly associated with susceptibility to anxious–depressive problems. Thus, threat sensitivity and disinhibition can be conceptualized as core biobehavioral factors associated broadly (i.e., transdiagnostically) with psychopathology. Consistent with this perspective, Venables et al. (2017) showed that observed (phenotypic) relations for these traits—when quantified using self-report and neurophysiological indicators together—with internalizing symptomatology were substantially attributable to shared genetic variance. With regard to internalizing psychopathology specifically, although longitudinal data are needed to confirm such an assertion, weak inhibitory control, along with high emotional sensitivity (i.e., low meanness; Frick et al., 1999), represents a potentially important liability to distress-related problems in particular, and to a lesser degree, phobic fear disorders. Furthermore, although threat sensitivity (low boldness) appears to be especially important for fear disorders, it also contributes to pervasive-distress disorders.

With respect to research-related and applied clinical assessment, our findings provide clarification of how psychopathic symptomatology and internalizing psychopathology relate to one another, and in turn to neurobehavioral propensities. When quantified dimensionally, boldness represents threat sensitivity in reverse (see, e.g., Brislin et al., 2017; Kramer, Patrick, Krueger, & Gasperi, 2012) and, as

such, evidences a robust negative association with internalizing psychopathology as a whole—with fear-related disorders especially, and with distress disorders to a more moderate extent. Of note, these findings are consistent with those reported by Hicks and Patrick (2006) for the affective–interpersonal symptom component (Factor 1) of the Psychopathy Checklist–Revised (PCL-R) with self-report assessed facets of negative affectivity. Other published work focusing on correlates of narrower symptom facets of the PCL-R (e.g., Hall, Benning, & Patrick, 2004) indicates that inverse associations with negative emotional traits and symptoms are attributable mainly to the PCL-R's Interpersonal symptom facet—which correlates most strongly with boldness (Venables et al., 2014). In turn, our findings are also consistent with classic conceptual and empirical writings on psychopathy including, for example, Cleckley's (1950) concept of a "mask of sanity," Lykken's (1995) low anxiety/fear hypothesis, Hare, Frazelle, and Cox's (1978) findings of attenuated physiological fear reactivity, and Fowles' (1980) hypothesis of deficient behavioral inhibition system functioning as central to psychopathic personality.

Turning to the disinhibition dimension of the triarchic model, this construct corresponds to inhibitory control capacity in reverse (Patrick et al., 2012; Venables et al., 2018; see also Young et al., 2009). Associations between disinhibition and internalizing psychopathology across the two models underscore the importance of considering internalizing subfactors. Indeed, considering fear and distress together within a single internalizing factor obscured the important distinct relations of disinhibition with each of the internalizing subfactors; that is, whereas a moderate-to-strong association between disinhibition and general internalizing emerged, the model that included the subfactors showed that disinhibition is strongly associated with distress but only weakly with fear. Taken together, our findings for disinhibition suggest that although often considered relevant only to externalizing psychopathology, this trait dimension appears highly important for internalizing problems as well—particularly for distress-related symptomatology. These results for the trait of disinhibition underscore the assertion that the role of biobehavioral dispositions extends across symptom dimensions and, as such, can be considered truly transdiagnostic.

As described above, whereas a weak negative association ($\beta = -.18$, $p = .051$) emerged between meanness and general internalizing, it appeared that this was driven, at least in part, by this trait's unique negative association with distress symptomatology, as meanness was unrelated to fear disorder symptoms. This finding for the trait of meanness further highlights the importance of disentangling subdimensions of internalizing. Notably, although the dimensions of disinhibition and meanness were moderately correlated ($r = .50$) in the current sample, these traits showed opposing relations with broad negative affectivity (represented by the general internalizing factor) and anxious-dysphoric symptomatology (represented by the distress subfactor). This finding fits with previous theoretical and empirical work suggesting that meanness involves a lack of emotional sensitivity (e.g., Frick et al., 1998). As described below, interactive effects of meanness and boldness in the explanation of fear further support this contention. Importantly, other research suggests that meanness is multifaceted, encompassing distinguishable subcomponents of callousness, unemotionality, and unconcern (Frick, Ray, Thornton, & Kahn, 2014; Viding & Kimonis, 2018). Thus, the contrasting relations for meanness versus disinhibition with distress symptomatology and broad negative affectivity may reflect distinct facets of meanness involving emotional insensitivity. Further systematic research will be needed to evaluate this possibility.

In addition to the implications of these main effects, the finding of a boldness by disinhibition interaction in accounting for variance in general internalizing has notable implications. In addition to corroborating prior research evidence (i.e., Latzman et al., 2019, Sellbom, 2015), this finding indicates a moderating effect of high boldness on the negative affectivity that typically accompanies high disinhibition. This fits well with the idea that the "mask of sanity" described by Cleckley (1950) reflects the combination of high boldness together with high disinhibition (Patrick, 2018). Specifically, high boldness operates to suppress the positive association of disinhibition with internalizing, while not dampening its positive association with externalizing—as evidenced by weak positive or negligible associations of boldness with impulse control problems (e.g., Benning et al., 2005; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005; Drislane et al., 2018). It is further important to note that this interactive effect did not emerge in the two-factor internalizing model specifying distinct fear and distress subfactors. The implication is that the moderating effect of boldness on disinhibition's association with internalizing symptomatology pertains to the broad negative affectivity or demoralization component that fear and distress disorders share. As such, boldness may operate more as a moderator of the *appearance* of externalizing psychopathology than as a direct contributor, in line with configural perspectives on the nature of psychopathic personality (e.g., Lilienfeld et al., 2012; Lilienfeld et al., in press; Patrick, 2018; Skeem et al., 2011).

Within the two-factor model, however, a significant meanness by boldness interaction did emerge in the prediction model for fear symptomatology. Specifically, whereas meanness was unrelated to fear ($\beta = .01$) at the main effect level, it did evidence an association in the context of low boldness. Specifically, in the context of low boldness, meanness appeared to exert a protective effect with regard to level of fear symptomatology. That is, meanness

attenuated the risk conferred by low levels of boldness. As described below, this may reflect the emotional insensitivity associated with meanness (e.g., Frick et al., 1998).

As a final point, the current work extends prior published work focusing on relations between self-reported internalizing psychopathology and a single manifest measure of the triarchic model traits (Latzman et al., 2019). The focus of the current study on interview-assessed internalizing psychopathology is important clinically because interview-based evaluation of symptomatology is the dominant approach used in clinical settings. Additionally, the current study's use of different harmonized scale measures to quantify triarchic biobehavioral traits as latent variables is important because it indicates that a construct-based approach to assessment can facilitate prediction of clinical outcomes (Patrick et al., 2019). As an example, one of the triarchic scale sets used in the current study was composed of items from the PID-5 (Krueger et al., 2012)—a dimensional measure of personality pathology that is increasingly being used in clinical research studies (e.g., Bach, Sellbom, & Simonsen, 2017) and is freely available (https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/DSM/APA_DSM5_The-Personality-Inventory-For-DSM-5-Full-Version-Adult.pdf). Current study findings suggest that the PID-5 triarchic scales, as harmonized measures of core biobehavioral traits (Patrick & Drislane, 2015; Patrick et al., 2019), can be used to effectively quantify dispositional risk for internalizing psychopathology (Venables et al., 2017).

Links to Existing Models of Psychopathology. As the triarchic trait dimensions are transdiagnostic in nature and explicitly biobehavioral with clear neural-systems referents, these dimensions are uniquely well-suited for lines of investigation encouraged by recent federal initiatives. For example, the National Institute of Mental Health's Research Domain Criteria (RDoC) initiative represents an attempt to advance understanding of the neurobiological bases of mental illness through a focus on transdiagnostic biobehavioral constructs (Insel et al., 2010; Kozak & Cuthbert, 2016). Specifically, RDoC provides researchers with a matrix of neurobiologically-oriented constructs, organized into broader "systems" domains, to help guide the study of clinical phenotypes. Considered within this perspective, the triarchic trait dimensions have clear RDoC counterparts: disinhibition links to the construct of "response inhibition" within the Cognitive Systems domain, boldness links to the construct of "acute threat" in the Negative Valence Systems domain, and meanness links to the construct of "affiliation and attachment" in the Social Systems domain.

Complementing the RDoC initiative, the HiTOP consortium has advanced a working multilevel structural model of psychopathology (Kotov et al., 2017; Krueger et al., 2018) as an alternative to traditional categorical systems for psychiatric classification. HiTOP conceptualizes psychopathology in terms of a hierarchy, beginning with basic dimensions of clinical symptomatology, which cohere into syndromes, and in turn into broad internalizing and externalizing spectra. Of note, the HiTOP model represents the internalizing spectrum in terms of distinct fear and distress subdimensions and the externalizing spectrum in terms of distinct disinhibitory and antagonistic subdimensions. This hierarchical–dimensional approach provides a strategic solution for addressing challenges with current nosologies, such as arbitrary boundaries between disorders, high comorbidity, and phenotypic heterogeneity within disorders. The triarchic biobehavioral traits may offer a means for interfacing major parts of the HiTOP psychopathology system (i.e., INT/EXT and their subdimensions) with key neural-systems constructs from the RDoC framework.

Strengths and Limitations. An important strength of the current study is that internalizing symptoms and triarchic dimensions were assessed through different modalities of measurement (i.e., structured clinical interview and self-report questionnaire, respectively), thereby reducing the extent to which observed associations can be attributed to shared method variance. At the same time, we also acknowledge certain limitations to the current work. Although generally considered adequate for the types of modeling analyses performed and reported here (e.g., Wolf, Harrington, Clark, & Miller, 2013), the sample size of the current study was not as large as those of many in which similar analyses have been conducted. Furthermore, although a three-way interaction among triarchic dimensions would be interesting to investigate in the explanation of psychopathology-related outcomes, our sample size did not provide the statistical power required for this. It will thus be interesting in future research with much larger samples to test the possibility of a three-way interaction. Additionally, while a broad range of internalizing symptomatology was represented in our participant sample, the sample was not explicitly clinical in nature. Follow-up studies using clinical participant samples (e.g., civil or forensic inpatients, clinic outpatients) will be valuable for establishing the generalizability of the current findings.

Conclusion and Future Directions

Limitations notwithstanding, the current study provides valuable insights into the association between the triarchic trait dimensions and internalizing psychopathology and has important implications for clinical assessment and research. A unique feature of the current study is that the internalizing symptom dimensions and triarchic constructs were operationalized as latent factors. This approach allows results from the current work to be generalized to different scale operationalizations of the triarchic dimensions (i.e., TriPM, MPQ-Tri, PID-5-Tri). Indeed, the triarchic model was explicitly formulated as a construct-oriented framework, as

opposed to a manifest-measure-based framework (Patrick et al., 2009). This is important because it allows for the nomological networks of the triarchic model constructs to be explored in existing data sets that provide for effective item-based operationalization of these constructs (see, e.g., Brislin et al., 2018).

Our results also highlight the importance of modeling covariation patterns among indicators of psychopathology—in this case, symptoms of various anxious–depressive disorders. Accounting for overlapping as well as distinctive aspects of clinical problems of different types is a key feature of the emerging HiTOP framework for psychopathology. The current work, together with findings from other recent research (e.g., Nelson et al., 2016; Venables et al., 2017), suggests the triarchic trait constructs can prove useful for interfacing major dimensions of the HiTOP model with neural systems concepts and measures. Specifically, a research framework can be envisioned in which dimensions of psychopathology as delineated by the HiTOP model are connected to RDoC neural-systems constructs, using the triarchic model traits as a conceptual–empirical interface. A framework of this type would be immensely valuable for advancing neurobiological understanding of anxious–depressive problems and other clinical conditions, and contributing to new neurobiologically informed methods of treatment for such problems.

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Supplemental Material

Supplemental material for this article is available online.

Note

1. Given previous studies in which GAD has been included as an indicator of distress psychopathology, a supplemental model was specified in which GAD was retained as an indicator of the distress subfactor. In this model, associations between these two internalizing subdimensions and triarchic dimensions were consistent with associations in the reported model in which GAD was not included as an indicator of either internalizing subdimension; however, within this model, the fear and distress factors correlated more highly with one another (.956).

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