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Correlates of externalizing psychopathology in incarcerated men

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Abstract

Externalizing traits are extremely costly for society and disproportionately prevalent among incarcerated individuals. The Hierarchical Taxonomy of Psychopathology (HiTOP) is an empirically derived classification system that approaches psychopathology dimensionally and was developed in response to critiques of current diagnostic classification systems. The Externalizing Spectrum Inventory – 100 item version (ESI-100) is an assessment of externalizing problems that fits within the HiTOP framework and characterizes dimensional externalizing traits. The current study aimed to replicate prior research examining the convergent validity of the ESI Total Score by examining associations with psychopathy, conduct disorder, and substance abuse among incarcerated men. 1,808 participants had ESI-100 data, although sample sizes across criterion measures varied. The majority of results replicated relationships between the ESI 159-item version and externalizing disorders and negative emotionality. Less is known about the dimensional relationships between externalizing traits as measured by the ESI-100 and internalizing disorders and symptoms, and other correlates of externalizing. The study extended previous results by examining associations between the ESI-100 and internalizing disorders, impulsivity, childhood trauma, and emotion regulation as a test of discriminant validity. Analyses revealed associations between the ESI-100 and childhood trauma, impulsivity, emotion regulation difficulties, and symptoms (but not diagnoses) of internalizing disorders. These results enhance our understanding of dimensional traits of externalizing and suggest nuanced relationships between externalizing and internalizing traits. Results have important implications (e.g., transdiagnostic treatment targets) for treatment of mental health disorders by highlighting the importance of cross-diagnostic treatment approaches.

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Author Note: Data utilized for study procedures and code used for all analyses can be made available upon request. All materials utilized in this study are publicly available online or through request to the authors of those measures. We have reported how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study. Neither the hypotheses nor analyses for this study were preregistered. Odile Rodrik and Shelby Weaver contributed to the conceptualization, data curation, formal analysis, investigation, and writing (original draft and reviewing/editing). Kent Kiehl contributed to the funding acquisition, resources, and writing (reviewing/editing). Michael Koenigs contributed to the conceptualization, funding acquisition, resources, supervision, and writing (review/editing).

Keywords

externalizing psychopathology; HiTOP

Introduction

Externalizing psychopathology is characterized by impulsive, disruptive, and disinhibited behaviors such as aggression, substance use, and antisocial acts (American Psychiatric Association, 2013). These have historically been considered and examined as symptoms of separate, categorical diagnoses (e.g., substance use disorder, antisocial personality disorder) (American Psychiatric Association, 2013), however recent effort has been made to conceptualize these individual traits within a broader spectrum of externalizing psychopathology (Kotov et al., 2017; Krueger et al., 2007). Externalizing behavior is particularly prevalent among individuals involved with the criminal justice system, and creates significant economic and societal costs (Kyckelhahn, 2015; Wagner & Rabuy, 2017). Accurate measurement of externalizing psychopathology and elucidation of the risk factors, comorbidities, and correlates of externalizing behavior is of the utmost importance for the development of more effective treatment and/or prevention targets.

One critical consideration for clinical research is the measurement and diagnosis of externalizing traits. Critiques of the dominant categorical classification system for mental illness in the U.S., the Diagnostic and Statistical Manual for Mental Health Disorders (DSM-5; American Psychiatric Association, 2013) include high rates of diagnostic comorbidity, heterogeneity within categories, low diagnostic reliability, and diagnostic thresholds resulting in untreated subthreshold symptoms (see Kirk et al., 2015 for a review). These critiques led to the development of alternate classification systems, such as the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017). HiTOP approaches psychopathology dimensionally and proposes multiple empirically-derived spectra composed of constellations of similar and overlapping symptoms. Specifically, the HiTOP model proposes a general “superspectra” of externalizing traits (Krueger et al., 2021), which contains separate underlying spectra reflecting Disinhibited Externalizing and Antagonistic Externalizing traits (Kotov et al., 2017). Recent work has demonstrated utility in the measurement, diagnosis, and predictive validity of the HiTOP framework for psychopathology generally, and externalizing psychopathology more specifically (see Krueger et al., 2021 for a brief review). Although there is not yet a comprehensive assessment for HiTOP, one is currently under development (Kotov et al., 2021; Simms et al., 2022), and the Externalizing Spectrum Inventory, created by Krueger and colleagues (ESI; Krueger et al., 2007), has been identified as a relevant measure of externalizing traits that aligns closely with the HiTOP framework in capturing this proposed structure of externalizing psychopathology (Kotov et al., 2017).

The ESI is a 415-item self-report assessment that indexes traits and behaviors present across externalizing disorders, such as disinhibition, impulsivity, substance use, and aggression (Krueger et al., 2007). The ESI measures a hierarchical model of externalizing behavior in which there exist externalizing traits (e.g., an externalizing “superspectra”), a factor of

general disinhibition, and two lower-order subfactors: Callous-Aggression and Substance Use¹, closely mirroring the HiTOP model of externalizing psychopathology. This model is supported by research suggesting there exists general risk for externalizing traits in addition to unique genetic and environmental risk for specific subfactors of externalizing traits (Krueger et al., 2005). Hall, Bernat & Patrick (2007) investigated the use of an 100-item screening version of the ESI and found convergent validity between the 100-item Total Score and self-reported negative emotionality, low constraint, and antisocial behaviors (Hall et al., 2007). Venables & Patrick (2012) were the first to investigate a shortened version of the ESI (159-item) in relation to measures that are conceptually and empirically related to externalizing behavior, such as psychopathic traits, antisocial personality disorder, substance abuse, aggression, and narcissism in incarcerated adult men. This study showed strong associations between the ESI and relevant externalizing disorders, providing evidence for convergent validity of ESI scores.

Less work has focused on examining the discriminant validity of the ESI, particularly how it relates to correlates of externalizing disorders as well as internalizing symptoms such as post-traumatic stress, depression, anxiety, and personality disorders. Impulsivity, childhood trauma, and emotion dysregulation have all been associated with externalizing problems. Emotion (dys)regulation cuts across diagnostic criteria (Beauchaine, 2015; Beauchaine & McNulty, 2013), occurs in most internalizing and externalizing disorders, and is associated with substance use, aggression, impulsivity, and risk-taking (Bonn-Miller et al., 2008; Cohn et al., 2010; Garofalo et al., 2018; Gratz et al., 2009; Leith & Baumeister, 1996; Messman-Moore et al., 2010; Schreiber et al., 2012; Sheppes et al., 2015; Tager et al., 2010; Tull et al., 2012; Vilhena-Churchill & Goldstein, 2014; Weiss et al., 2012; Werner & Gross, 2010). Similarly, the experience of childhood trauma and posttraumatic stress disorder (PTSD) have been associated with externalizing behavior, such as substance use disorders, impulsivity, antisocial behavior, aggression, violence, risky sexual behavior, and gambling (Carliner et al., 2017; Dalsklev et al., 2019; Dutra & Sadeh, 2018; Gillikin et al., 2016; Lusk et al., 2017; Roy, 2005; Tucci et al., 2010; Weiss et al., 2012).

Though the HiTOP model acknowledges that all spectra are positively correlated with one another, the subfactors, syndromes/components, and symptoms that fall under specific spectra should theoretically be weakly related to other spectra. In other words, whereas internalizing and externalizing spectra should be somewhat positively related, reflecting a general proclivity towards psychopathology, depressive or avoidant psychopathology should be more strongly related to the internalizing spectra than the externalizing (disinhibited or antagonistic) spectra. In another example, we might expect that personality disorders characterized primarily by avoidance or detachment symptoms (e.g., Avoidant Personality Disorder, Schizoid Personality Disorder) will show weak or no associations with externalizing psychopathology, but those characterized by disinhibition or callous-aggression (e.g., Antisocial Personality Disorder), will show strong associations with externalizing psychopathology as measured by the ESI (Conway et al., 2020; Harford et al., 2013).

¹Information on the empirical methodology used to determine the structure of the 415-item version of the ESI can be found in Krueger et al., 2007.

Accordingly, this study examined a shortened version of the ESI (100-item version; Blonigen et al., 2011) in a sample of incarcerated adult men to address two aims: 1) assess the convergent validity of the ESI-100 Total Score, and 2) assess the discriminant validity of the ESI-100 Total Score. Specifically, for Aim 1 we conducted a constructive replication (Lykken, 1968) of previous findings (Hall et al., 2007; Venables & Patrick, 2012) in a novel, larger sample of incarcerated men. For Aim 2 we sought to extend our understanding of the ESI-100 by assessing relationships with theoretically dissimilar psychopathology, as well as risk factors, correlates, and comorbidities associated with externalizing traits. While both aims include the same novel sample of incarcerated adult men, the data are presented as separate “replication” and “extension” sections to clarify their relationship to previous literature. For the replication aim, we hypothesized results would mirror Venables & Patrick (2012): ESI Total Score would be: 1) positively associated with DSM externalizing disorders, psychopathic traits, criminal history, and negative emotionality, 2) negatively associated with constraint, and 3) not associated with positive emotionality. For the second aim, we hypothesized that ESI Total Score would 1) be positively associated with ER difficulties, impulsivity, and childhood trauma, and 2) show weak or no association with theoretically dissimilar disorders characterized by avoidance, detachment, or depressive symptoms.

Method: Replication

Participants

Participants were 1,808 adult males recruited from medium-security prisons in a Midwestern state recruited between June 2007 and December 2019. The number of participants with each criterion measure differs due to the addition of new assessments over the course of the research study. Participants were eligible if they met the following criteria: 18–55 years old, no documented diagnosis of bipolar or psychotic disorder, above a 4th grade reading level, IQ \geq 70 (WAIS-III or WASI-II; Wechsler, 1981, 1999), and had complete ESI-100 data. Participants provided consent and were compensated for participation. This study was approved by the University’s Institutional Review Board. See Table 1 for Demographic information.

Measures

Externalizing Spectrum Inventory–100 Item version (ESI-100; Blonigen et al., 2011; Hall et al., 2007).—The ESI is a self-report instrument assessing traits of externalizing psychopathology. The current study utilized the 100-item version (ESI-100), a short-form version of the 415-item assessment (Blonigen et al., 2011; Hall et al., 2007; Krueger et al., 2007). Due to the fact that the hierarchical subfactor structure of the 100-item version has not yet been examined, we include analyses concerning only the Total Score (ESI_{TOT}) of the ESI-100, which was derived by summing across all items. Further, the 100-item version was designed particularly as a screening version of the full-form ESI and does not index the lower-order subfactors appropriately. In fact, in their work, Venables and Patrick added an additional 59 items to the 100-item version of the ESI to ensure adequate coverage of all subfactors (Venables & Patrick, 2012). In this study, no additional items were added to the 100-item version, therefore only Total Scores are

reported. The Total Score thus represents a dimensional measure of externalizing traits broadly, conceptually similar to the externalizing “superspectra” in the HiTOP framework. Examining the convergent and discriminant validity of the Total Score thus lends insight into how well the ESI-100 captures general externalizing traits. Traits that comprise ESI₁₀₀ include Alcohol Problems, Blame Externalization, Boredom Proneness, Destructive Aggression, Drug Use, Empathy, Excitement Seeking, Fraud, Honesty, Impatient Urgency, Irresponsibility, Marijuana Problems, Marijuana Use, Physical Aggression, Problematic Impulsivity, Rebelliousness, Relational Aggression, and Theft. Sample items include “I have broken someone’s things to prevent them from being used” and “I’ve hurt someone’s feelings on purpose to get back at them.” Cronbach’s α was .97.

Personality

Multidimensional Personality Questionnaire–Brief Form (MPQ-BF; Patrick et al., 2002).: The MPQ-BF is a 155-item self-report measure of personality, divided into 11 traits: Wellbeing, Social Closeness, Social Potency, Achievement, Stress Reaction, Alienation, Aggression, Control, Harm Avoidance, Traditionalism, and Absorption that make up three higher-order factors: Positive Emotionality, Negative Emotionality, and Constraint. Cronbach’s α ($M = .78$) ranged from .58 (Traditionalism) to .86 (Aggression).

Externalizing Psychopathology

Structured Clinical Interview for DSM-IV and DSM-5 (SCID-IV and SCID-5; First, 2015; First et al., 2002).: Participants completed the SCID-5 ($n = 253$) or SCID-IV ($n = 15$). Rates of diagnoses did not statistically differ between interviews; data were combined for analyses. Current and past diagnosis of alcohol (AUD), drug use disorders (DUD), Antisocial Personality Disorder (ASPD), Conduct Disorder (CD), and Narcissistic Personality Disorder (NPD) were assessed. For a diagnosis of AUD or DUD, both SCID-IV Abuse and Dependence diagnoses were included. AUD and DUD were examined separately and together indicating the diagnosis of any substance use disorder (“SUD”). Only SCID-5 data ($n = 253$) contained information on total symptoms for SUD, AUD, or DUD for analyses. ASPD, CD, and NPD diagnoses and total symptoms were utilized in analyses.

Psychopathy

Psychopathy Checklist–Revised (PCL-R; Hare, 2003).: The PCL-R is a 20-item measure of psychopathy consisting of a semi-structured interview and institutional file review. Traits are scored on a scale of 0 (*not present*) to 2 (*present*), with a maximum score of 40. A score of 30 indicates a diagnosis of psychopathy (Hare, 2003). Traits are divided into two Factors: Interpersonal/Affective (Factor 1) and Lifestyle/Antisocial (Factor 2), and four Facets: Interpersonal (Facet 1), Affective (Facet 2), Lifestyle (Facet 3), and Antisocial (Facet 4). Interrater scores were available for a subset of participants ($n = 123$, 7.6% of the sample), $r = .96$. Cronbach’s α was suboptimal ($M = .64$), ranging from .53 (Facet 3) to .79 (PCL-R Total), similar to previous studies (e.g., Venables & Patrick, 2012).

Psychopathic Personality Inventory–Short Form (PPI-SF; Lilienfeld & Hess, 2001).: The PPI-SF is a 56-item self-report measure of psychopathic traits comprised of two higher-order factors: PPI-I (Fearless Dominance) and PPI-II (Impulsive Antisociality).

PPI-I includes Social Potency, Fearlessness, and Stress Immunity traits, and PPI-II includes Carefree Nonplanfulness, Impulsive Nonconformity, Machiavellian Egocentricity, and Blame Externalization. Cold-heartedness does not load strongly on either factor so is not included in these higher-order factors (Lilienfeld & Andrews, 1996). Cronbach's α ($M=.74$) ranged from .62 (Impulsive Nonconformity) to .82 (Impulsive Antisociality).

Criminal History—Criminal history was determined from participants' institutional file. Total Crime reflects the total number of charges or convictions. Crime charges were divided into Violent (Robbery, Assault, Murder, Sex, Weapons, Kidnapping) and Non-Violent (Theft, Drug, Negligence/Driving, Fraud, Escape, Obstruction of Justice, Crimes Against the State, Minor Miscellaneous).

Data Processing and Analysis

Self-report questionnaire data were prorated for 25% of missing data. Individuals with 25% of missing data were excluded from analyses for that measure. Final sample sizes for each assessment are reported in Table 1. Zero-order correlations assessed the relationship between ESI_{TOT} and each criterion measure as in Venables and Patrick, 2012. A p -value threshold of $< .001$ accounted for the large number of statistical tests. Correlation strengths were defined as such: $r < .5$ = weak; $r > .5$ and $< .7$ = moderate; $r > .7$ = strong.

Transparency and Openness

Data utilized for study procedures and code used for all analyses can be made available upon request. All materials utilized in this study are publicly available online or through request to the authors of those measures. We have reported how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study. Neither the hypotheses nor analyses for this study were preregistered.

Results: Replication

Results from Venables and Patrick (2012) were largely replicated. ESI_{TOT} was positively associated with Negative Emotionality, negatively associated with Constraint, and showed no association with Positive Emotionality. Associations between the ESI and MPQ are presented in Table 2. ESI_{TOT} was positively associated with externalizing disorders except NPD diagnosis. Associations between ESI and externalizing disorders and symptoms are presented in Table 3. ESI_{TOT} was positively associated with PPI-SF Total and PPI-II, but not PPI-I or Cold-heartedness. In addition, ESI_{TOT} was positively associated with all PCL-R Total, Factors, and Facets. ESI_{TOT} was associated with Total and Non-Violent Crime but was not significantly related to Violent Crime. Associations between the ESI, psychopathy, and crime are presented in Table 4.

Discussion: Replication

This study examined the dimensional nature of externalizing traits in a prison population and provides evidence for the validity of ESI-100 Total Score in measuring general externalizing traits and behaviors. In line with prior research (Venables & Patrick, 2012) and the HiTOP framework, ESI_{TOT} was associated with externalizing disorders, negative emotionality, and

lack of behavioral control. In all, these results suggest strong convergent validity of the ESI-100 Total Score in capturing externalizing psychopathology. We additionally found relationships that had not been previously reported. For example, the current study found positive relationships between ESI_{TOT} and Interpersonal/Affective traits of psychopathy, as measured by the PCL-R. This suggests that general externalizing may be associated not only with lifestyle and antisocial traits of psychopathy, as in Venables & Patrick (2012), but may also be related to interpersonal and affective functioning. The novel relationships identified in this study could be due to the relatively large sample of incarcerated participants ($n > 1,600$ had available ESI, PCL-R, MPQ-BF, and criminal history data in this study) compared to previous studies (e.g., $n = 235$ in Venables & Patrick, 2012).

Method: Extension

Measures

Clinical Disorders

SCID-IV and SCID-5.: Current and past Dysthymic (SCID-IV), Persistent Depressive (SCID-5), and Major Depressive Disorders were combined to form a Depressive Disorder variable. Therefore, an individual diagnosed with any of the prior disorders would be considered as having a “Depressive Disorder.” Current and past Panic, Agoraphobia, Social Phobia (SCID-IV), Social Anxiety (SCID-5), Specific Phobia, Generalized Anxiety, and obsessive-compulsive disorder were combined to form an Anxiety Disorder variable. Current and past PTSD formed a PTSD variable. Symptom count data was not available for Depressive Disorder, Anxiety Disorder, or PTSD, therefore self-report measures were utilized as described below under “Internalizing Psychopathology.” Diagnosis and symptom count data for Avoidant, Obsessive Compulsive, Paranoid, Schizotypal, Schizoid, Histrionic, and Borderline PDs from both the SCID-IV and SCID-5 were included. All interviews were conducted by trained graduate students or trained study staff. Inter-rater reliability data was not available for the SCID.

Personality Assessment Inventory-Borderline Scale (PAI-BOR; Morey, 1991).: The PAI-BOR is a 24-item self-report questionnaire assessing features of Borderline PD. Items are rated on a scale of 0 to 3. The PAI-BOR includes four subscales of symptoms: Affective Instability, Identity Problems, Negative Relationships, and Self-Harm. Cronbach’s α ($M = .75$) ranged from .62 (Negative Relationships) to .77 (Affective Instability and Self-Harm).

Internalizing Psychopathology Scales

Beck Depression Inventory-2nd Edition (BDI-II; Beck et al., 1961).: The BDI-II is a 21-item questionnaire that assesses severity and symptoms of depression. Items are rated from 0–3. The BDI-II yields a Total score as well as two subscales that measure Cognitive Symptoms (e.g., past failure, guilty feelings) and Affective/Somatic Symptoms (e.g., sadness, tiredness, fatigue). Cronbach’s α ($M = .83$) ranged from .76 (Cognitive Symptoms) to .84 (Affective/Somatic Symptoms).

Spielberger State Trait Anxiety Inventory (STAI; Spielberger, 1983).: The STAI is a 40-item questionnaire assessing for State Anxiety (i.e., current anxiety) and Trait Anxiety

(i.e., general anxiety). Twenty items comprise each subscale. Cronbach's α was high: State Anxiety = .93; Trait Anxiety = .92.

PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 is a 20-item self-report questionnaire assessing symptoms of PTSD in the past month. Items can be separated into four symptom clusters: Reexperiencing, Avoidance, Negative Cognitions/Mood, and Hyperarousal. Items are rated on a scale from 0 to 4. Cronbach's α was high across scales ($M = .89$), ranging from .83 (Hypervigilance) to .94 (PCL-5 Total). A correlation was computed for the two-item Avoidance cluster, $r = .72$.

Scales for Impulsivity, Emotion Regulation, and Childhood Trauma

UPPS-P Impulsive Behavior Scale (UPPS-P; Lynam et al., 2006). The UPPS-P is a 59-item questionnaire that assesses five domains of impulsivity: 1) Negative Urgency, 2) Lack of Premeditation, 3) Lack of Perseverance, 4) Sensation Seeking, and 5) Positive Urgency. Cronbach's α ($M = .83$) ranged from .80 (Perseverance) to .84 (Positive Urgency and Sensation Seeking).

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item questionnaire assessing difficulty with ER. Items are rated from 1 to 5. The DERS includes six subdomains: 1) Lack of Emotional Awareness, 2) Impulse-Control Difficulties in the Face of Negative Affect, 3) Lack of Emotional Clarity, 4) Difficulty Engaging in Goal-Directed Behavior in the Face of Negative Affect, 5) Limited Access to Emotion Regulation Strategies, and 6) Nonacceptance of Emotional Responses. Cronbach's α ($M = .86$) ranged from .80 (Emotional Clarity and Emotional Awareness) to .94 (DERS Total).

Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The ERQ is a 10-item self-report measure of habitual use of two ER strategies: Cognitive Reappraisal, reframing events or stimuli to change their meaning, and Suppression, ignoring or hiding an emotional experience or expression. Each item is rated on a scale of 1 to 7. Cronbach's α was .67 for Suppression and .88 for Cognitive Reappraisal.

Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994). The CTQ is a 28-item self-report measure assessing childhood abuse and neglect. In addition to a Total score reflecting overall instance of trauma, the CTQ assess five domains: 1) Physical Abuse, 2) Emotional Abuse, 3) Sexual Abuse, 4) Physical Neglect, and 5) Emotional Neglect. Items range from 1 to 5. Cronbach's α ($M = .87$) ranged from .77 (Physical Neglect) to .94 (Sexual Abuse).

Data Processing and Analysis

All Extension analyses examining relationships between the ESI-100 and criterion measures followed the same procedure as the Replication analyses. A p -value threshold of $< .001$ was used for Extension analyses.

Results: Extension

Personality Disorders

Relationships between ESI-100 and PD variables are presented in Table 5. Positive associations were observed primarily between ESI_{TOT} and Paranoid PD and Borderline PD. Total Symptoms of Paranoid and Borderline PDs as well as underlying traits of Borderline PD (as measured by the PAI-BOR) were associated with ESI_{TOT}. Avoidant, Obsessive Compulsive, Schizotypal, Schizoid, and Histrionic PD Diagnoses or Symptoms were not associated with ESI_{TOT}.

Internalizing Psychopathology and PTSD

Results from analyses between ESI-100 variables and internalizing disorders and PTSD are displayed in Table 6. ESI_{TOT} was not related to diagnoses of a Depressive Disorder, Anxiety Disorder, or PTSD. However, ESI_{TOT} was weakly positively associated with dimensional self-report measures of depression, anxiety, and PTSD (BDI-II, STAI, and PCL-5, respectively).

Correlates of Externalizing Behavior

ESI_{TOT} was positively associated with all subscales of the UPPS-P. Negative Urgency demonstrated the strongest correlation with ESI_{TOT}. All other zero-order correlations between ESI_{TOT} and impulsivity measures were in the weak range. ESI_{TOT} was positively correlated with DERS Total and all subscales of the DERS but was not significantly related to ERQ Cognitive Reappraisal or Suppression. ESI_{TOT} was weakly positively correlated with all CTQ variables. See Table 7 for associations between ESI_{TOT} and correlates of externalizing behavior.

Discussion: Extension

Results from the extension analyses support two main findings: 1) personality disorders/symptoms, except for Paranoid and Borderline PDs, were largely unrelated to externalizing psychopathology as measured by ESI-100 Total Score, and 2) externalizing traits, as captured by the ESI-100, were associated with emotion dysregulation, childhood maltreatment, and symptoms, but not diagnoses, of internalizing disorders.

Personality Disorders

Both Paranoid and Borderline symptoms were associated with externalizing traits broadly. That these two personality disorders are significantly correlated with the ESI-100 aligns with current work demonstrating that Paranoid PD loads significantly on both the Thought Disorder and Antagonistic Externalizing spectra, and that Borderline PD falls under the Antagonistic Externalizing spectra (Kotov et al., 2017). Personality disorders marked by detachment or avoidance showed no associations with externalizing traits. This aligns with the HiTOP framework, which places these disorders under separate spectra and does not predict strong associations with externalizing (Kotov et al., 2017).

Internalizing Symptoms and Risk-Factors for Externalizing

Criterion measures of emotion regulation and childhood trauma, and symptoms of depression, anxiety, and PTSD showed weak associations with externalizing. Importantly, diagnoses of internalizing disorders, but not dimensional assessments of internalizing symptoms, were unrelated to externalizing. These relationships are in line with previous work showing associations between PTSD symptoms, mood disorders, and impulsivity (Boschloo et al., 2012; Sadeh et al., 2018), relationships among childhood trauma, PTSD, aggression, and substance abuse (Anda et al., 2006; Chilcoat & Breslau, 1998; Gillikin et al., 2016; Taft et al., 2011, 2017). Together, these results are in line with work demonstrating that HiTOP spectra (e.g., internalizing and externalizing spectra) are indeed correlated with each other (Harford et al., 2013; Kotov et al., 2017; Patrick et al., 2013). These weak positive associations, therefore, may be capturing risk for general psychopathology (Caspi et al., 2014). Similarly, work has demonstrated the link between emotion dysregulation and a host of externalizing behaviors (Bonn-Miller et al., 2008; Cohn et al., 2010; Garofalo et al., 2018; Leith & Baumeister, 1996; Messman-Moore et al., 2010; Schreiber et al., 2012; Tager et al., 2010; Tull et al., 2012); current results further support emotion dysregulation as a transdiagnostic symptom of externalizing psychopathology. Nonsignificant associations between ER strategies and externalizing psychopathology suggests the use of individual regulation strategies may not be particularly predictive of externalizing behaviors.

The relationship between internalizing symptoms, but not diagnoses, and externalizing traits is noteworthy. Our results suggest that these important relationships may be obscured when only categorical diagnostic information is considered. In conjunction with literature citing varied limitations of diagnostic cut-offs (Kessler et al., 2003), these results show the importance of considering symptom data. Additionally, these results might suggest a discrepancy between clinician-rated (e.g., SCID-5) and self-report (e.g., BDI-II) measurement of mental health concerns. In a comprehensive meta-analysis conducted by Markon and colleagues, the authors found continuous measures (including self-report ones) may lead to a 15% increase in reliability and 37% increase in validity of measurement of psychopathology over the use of discrete measures (Markon et al., 2011). Accordingly, future studies should investigate the relationship between the ESI and dimensional measures that capture multiple subfactors of internalizing (e.g., Interview for Mood and Anxiety Symptoms (Kotov et al., 2015), instead of individual diagnoses.

Limitations

Despite the ease of implementation of the ESI-100 compared to the 415-item ESI, this shortened assessment may result in too few items for reliable estimates of all underlying traits of externalizing psychopathology. For example, some lower-order traits (i.e., Honesty and Blame Externalization), are comprised of only one item, potentially limiting our ability to find replicable or stable associations. Results should be interpreted cautiously with this understanding. Further, future studies should investigate whether the factor structure of the ESI-100 replicates that shown in the 159-item and 415-item versions examined in previous studies. Future studies should further examine whether subfactors on the 100-item version appropriately map on to the HiTOP framework by investigating their association with theoretically similar and dissimilar constructs, as in the current study. If, indeed,

subfactors on the ESI reliably align with HiTOP and demonstrate appropriate convergent and discriminant validity with other criterion measures, this would lend support for the ESI-100 as a brief HiTOP-friendly assessment of the externalizing spectrum. If subfactors do not align with the conceptual HiTOP framework, this would lend support for the use of only Total Scores on the ESI 100-item version. In this case, additional research should determine which, and how many, additional items are necessary to recreate the hierarchical factor structure seen in the 415-item version. Another limitation is the small percentage of participants with certain PDs in the current sample. For example, only two participants (0.8%) had a diagnosis of Histrionic PD and three participants (1.1%) had a diagnosis of Schizotypal PD, rates that are lower than the estimated prevalence in the general population (Grant et al., 2005; Pulay et al., 2009). These small sample sizes pose concerns for statistical power for these categorical diagnoses. Future studies should over-sample for participants diagnosed with less prevalent disorders. Additionally, the current study was unable to examine trait level associations with ASPD and CD and the ESI, as originally seen in Venables and Patrick (2012), as only diagnosis-level data for these disorders were available at time of the analysis. Future examinations of the ESI-100 therefore should include examinations of ASPD and CD traits. Finally, given the cross-sectional nature of the data, causality underlying the reported relationships cannot be established.

Constraints on Generality

The results of this study support the validity of the ESI-100 Total Score in assessing the dimensional nature of externalizing psychopathology and its risk factors and correlates. There are important constraints, however, that should be acknowledged in the interpretation and generalizability of these findings. This study includes data collected only from incarcerated adult men. Additionally, while the study participants included substantial proportions of Black and White incarcerated individuals (35.6% and 54.6% of the overarching sample, respectively), other racial minorities are less well represented (9.8%). It is likely that results would be affected by these important moderators; more data is needed at this time to determine how the ESI-100 differs with regard to sex and ethnicity. Additionally, the exclusion criteria utilized in this study may limit the generalizability of these results in important ways. Primarily, the study excluded individuals with a diagnosis of bipolar or psychotic disorder, therefore these results may not be representative of individuals who have manic or psychotic experiences in conjunction with mood or externalizing symptoms, and moreover, may not represent the prison population as a whole. We have no reason to believe that the results depend on other characteristics of the participants, materials, or contexts.

Clinical Implications

Despite these limitations, the results of this paper provide support for the convergent and discriminant validity of the ESI Total Score in measuring externalizing traits and support the use of the ESI. Furthermore, results have meaningful implications for the study and treatment of externalizing disorders. Firstly, these results further implicate ER as a potential transdiagnostic treatment target (Aldao et al., 2016; Berking et al., 2008; Gratz et al., 2015; Sloan et al., 2017), as emotion dysregulation is likely present in an estimated 40.3% of DSM diagnoses (Jazaieri et al., 2013). This work could shift therapeutic treatments towards specific skills training, such as enhancing emotional clarity, strategy selection, and

implementation difficulties (Fernandez et al., 2016), which may be particularly fruitful for an externalizing population. Associations between externalizing traits and limited access to ER strategies, but not individual regulation strategies themselves, bolster work suggesting ER flexibility may be a particularly relevant construct for psychopathology (Aldao et al., 2015).

Furthermore, comorbid internalizing and externalizing symptoms must be considered in treatment. Results across the Replication and Extension sections demonstrate that externalizing traits are related to the experience of strong negative affect, suggesting that negative emotionality may be transdiagnostic. These results are bolstered by recent studies demonstrating that disinhibited negative affect is robustly correlated with general psychopathology (Forbes et al., 2021). These results support a move away from categorical diagnostic frameworks and towards a dimensional approach to psychopathology, likely impacting treatments for mental health disorders and externalizing disorders in particular. For instance, transdiagnostic treatment approaches, such as the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2010) might be adapted and utilized for individuals who present with externalizing traits coupled with clinically-significant emotion dysregulation. Identifying transdiagnostic treatment targets that underlie internalizing and externalizing disorders alike is increasingly needed in place of developing disorder-specific therapeutic modalities.

Conclusion

In sum, this study replicated previous literature finding associations between ESI Total Score and externalizing disorders such as psychopathy, ASPD, and substance abuse. Analyses extended to include internalizing traits and disorders, personality disorders, and risk factors for externalizing behavior, and found that internalizing symptoms, childhood trauma, ER, and impulsivity were significantly associated with externalizing psychopathology broadly. In all, results support convergent and discriminant validity of the ESI Total Score in the assessment of externalizing psychopathology. Furthermore, this study contributes to ongoing literature investigating dimensional frameworks of psychopathology, such as the HiTOP framework and their measurement. These results have far-reaching implications for the treatment and prevention of externalizing traits and disorders.

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Public Significance Statement

This study replicates and extends findings on the measurement of dimensional relationships between externalizing traits and internalizing disorders, childhood trauma, impulsivity, and emotion regulation in line with the HiTOP framework. The results of this study add important evidence for the consideration of symptoms of psychopathology instead of diagnoses and broaden our understanding of the risk-factors and comorbidities of externalizing traits.

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Table 1.

Background information for separate samples.

Sample	n	Age	IQ	%Black	%White	% Other/Unknown
ESI-100	1,808	32.6 (8.1)	97.4 (12.4)	35.6	54.6	9.8
PCL-R	1,622	33.0 (8.0)	97.2 (12.4)	35.7	55.5	8.8
Criminal History	1,723	32.6 (8.1)	97.3 (12.5)	36.0	54.9	9.1
MPQ-BF	1,786	32.7 (8.1)	97.4 (12.4)	35.3	54.9	9.8
SCID-IV	15	36.7 (10.3)	95.3 (16.1)	40.0	40.0	20.0
SCID-5	253	35.1 (8.8)	97.7 (11.9)	23.3	62.1	14.6
PPI-SF	1,784	32.6 (8.0)	97.4 (12.5)	35.6	54.8	9.6
DEERS	264	35.7 (8.1)	99.1 (12.6)	29.5	60.6	9.9
ERQ	264	35.7 (8.1)	99.1 (12.6)	29.5	60.6	9.9
CTQ	803	34.1 (8.4)	99.2 (12.5)	34.0	54.5	11.5
UPPS-P	1,404	33.0 (8.3)	97.2 (12.4)	37.0	52.2	10.8
BDI-II	1,460	32.9 (8.3)	97.3 (12.6)	37.3	52.3	10.4
PCL-5	238	35.1 (8.7)	98.0 (11.7)	27.7	56.3	16.0
STAI	1,481	32.9 (8.3)	97.2 (12.6)	37.1	52.3	10.6
PAI-BOR	1,537	32.8 (8.2)	97.1 (12.6)	36.9	52.8	10.3

Note: ESI = Externalizing Spectrum Inventory; PCL-R = Psychopathy Checklist-Revised; MPQ-BF = Multidimensional Personality Questionnaire-Brief Form; SCID = Structured Clinical Interview for DSM; PPI-SF = Psychopathic Personality Inventory-Short Form; DEERS = Difficulties in Emotion Regulation Scale; CTQ = Childhood Trauma Questionnaire; UPPS-P = Impulsive Behavior Scale; BDI-II = Beck Depression Inventory-2nd Edition; STAI = Spielberger State Trait Anxiety Inventory; PAI-BOR = Personality Assessment Inventory-Borderline Scale; ERQ = Emotion Regulation Questionnaire

Table 2.

Associations between ESI-100 and self-report personality.

Criterion of Interest	ESI _{TOT}	
	<i>r</i> _{zero-order}	
<i>Higher-Order MPQ-BF Factors</i>		
Positive Emotionality	.01	
Negative Emotionality	.55	
Constraint	-.36	
<i>Primary MPQ-BF Traits</i>		
Wellbeing	-.06	
Social Closeness	-.14	
Social Potency	.28	
Achievement	-.12	
Stress Reaction	.41	
Alienation	.29	
Aggression	.59	
Control	-.44	
Harm Avoidance	-.19	
Traditionalism	-.10	
Absorption	.14	

Note: bolded results are significant at $p < .001$. MPQ-BF=Multidimensional Personality Questionnaire-Brief Form.

Table 3.

Associations between ESI-100 and externalizing diagnoses.

Criterion of Interest	% with diagnosis	ESI _{Trot}	r _{zero-order}
<i>SUD</i>			
Diagnosis	84.3	.37	
*Total Symptoms		.59	
<i>AUD</i>			
Diagnosis	60.4	.37	
*Total Symptoms		.46	
<i>DUD</i>			
Diagnosis	75.7	.42	
*Total Symptoms		.53	
Nicotine Use symptoms		.26	
<i>Antisocial PD</i>			
Diagnosis	43.0	.47	
Total Symptom Count		.51	
<i>Narcissistic PD</i>			
Diagnosis	3.0	.09	
Total Symptom Count		.23	
<i>Conduct Disorder</i>			
Diagnosis	48.9	.42	
Total Symptom Count		.45	

Note:

* Total symptom analyses for all substance disorders included only participants with SCID-5 data ($n = 253$).

Bolded results are significant at $p < .001$. SUD = any Substance Use Disorder; AUD = Alcohol Use Disorder; DUD = Drug Use Disorder not including alcohol.

Table 4.

Associations between ESI-100, psychopathy and crime.

Criterion of Interest	ESI _{TOT}	
	$r_{\text{zero-order}}$	
<i>PPI-SF</i>		
Total		.48
<i>PPI-SF Factors</i>		
PPI-I (Fearless Dominance)	.04	
PPI-II (Impulsive Antisociality)	.61	
Cold-heartedness	.03	
<i>PPI-SF Traits</i>		
Impulsive Nonconformity	.35	
Blame Externalization	.34	
Machiavellian Ego	.56	
Carefree Nonplanfulness	.37	
Stress Immunity	-.28	
Social Potency	.04	
Fearlessness	.25	
<i>PCL-R</i>		
Total		.48
Factor 1 (Interpersonal/Affective)	.25	
Factor 2 (Lifestyle/Antisocial)	.54	
<i>PCL-R Facets</i>		
Facet 1 (Interpersonal)	.23	
Facet 2 (Affective)	.16	
Facet 3 (Lifestyle)	.49	
Facet 4 (Antisocial)	.45	
<i>Crime History</i>		
Total Crime		.22
Violent Crime	.01	
Non-Violent Crime		.23

Note: bolded results are significant at $p < .001$. PPI-SF = Psychopathic Personality Inventory-Short Form; PCL-R = Psychopathy Checklist-Revised.

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Table 5.

Associations between ESI-100 and personality disorders.

Criterion of Interest	% with diagnosis	ESI _{TOT}	$r_{\text{zero-order}}$
<i>Avoidant PD</i>			
Diagnosis	4.9	.12	
Total Symptom Count		.12	
<i>Obsessive Compulsive PD</i>			
Diagnosis	9.7	.09	
Total Symptom Count		.08	
<i>Paranoid PD</i>			
Diagnosis	8.6	.19	
Total Symptom Count		.24	
<i>Schizotypal PD</i>			
Diagnosis	1.1	.02	
Total Symptom Count		.13	
<i>Schizoid PD</i>			
Diagnosis	4.1	-.01	
Total Symptom Count		-.02	
<i>Histrionic PD</i>			
Diagnosis	0.8	.11	
Total Symptom Count		.04	
<i>Borderline PD</i>			
Diagnosis	6.3	.14	
Total Symptom Count		.34	
<i>PAI-BOR</i>			
Total		.59	
Affective Instability		.50	
Identity Problems		.38	
Negative Relationships		.40	
Self-Harm		.56	

Note: bolded results are significant at $p < .001$. UPPS-P = Impulsive Behavior Scale; PAI-BOR = Personality Assessment Inventory-Borderline Scale.

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Table 6.

Associations between ESI-100 and internalizing psychopathology.

Criterion of Interest	% with diagnosis	ESI _{TOT} r _{zero-order}
Depressive Disorder*	36.9	.03
<i>BDI-II</i>		
Total		.25
Cognitive		.20
Affective/Somatic		.25
Anxiety Disorder*	22.8	.02
<i>STAI</i>		
State Anxiety		.22
Trait Anxiety		.32
PTSD*	28.7	.10
<i>PCL-5</i>		
Total		.32
Reexperiencing		.23
Avoidance		.17
Negative Cognitions/Mood		.27
Hyperarousal		.38

Note:

* Data obtained from the SCID interview ($n = 268$).

Bolded results are significant at $p < .001$. BDI-II = Beck Depression Inventory – 2nd Edition; STAI = Spielberger State Trait Anxiety Inventory; PCL-5 = PTSD Checklist for DSM-5.

Table 7.

Associations between ESI-100 and correlates of externalizing behavior.

Criterion of Interest	ESI ₁₀₀	
	$r_{\text{zero-order}}$	
<i>UPPS-P</i>		
Negative Urgency	.58	
Positive Urgency	.46	
Sensation Seeking	.34	
(Lack of) Premeditation	.34	
(Lack of) Perseverance	.30	
<i>DEERS</i>		
Total	.35	
Lack of Emotional Awareness	.14	
Impulse Control Difficulty	.38	
Lack of Emotional Clarity	.24	
Difficulty with Goal-Directed Behavior	.30	
Limited Access to Emotion Regulation Strategies	.30	
Nonacceptance of Emotional Responses	.21	
<i>ERQ</i>		
Cognitive Reappraisal	-.04	
Suppression	-.03	
<i>CTQ</i>		
Total	.23	
Physical Abuse	.24	
Emotional Abuse	.20	
Sexual Abuse	.11	
Physical Neglect	.18	
Emotional Neglect	.18	

Note: bolded results are significant at $p < .001$. DEERS = Difficulties in Emotion Regulation Scale; ERQ = Emotion Regulation Questionnaire; CTQ = Childhood Trauma Questionnaire.