Measuring Suicidality Using the Personality Assessment Inventory: A Convergent Validity Study With Federal Inmates

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Abstract

Although numerous studies have examined the psychometric properties and clinical utility of the Personality Assessment Inventory in correctional contexts, only two studies to date have specifically focused on suicide ideation. This article examines the convergent validity of the Suicide Ideation Scale and the Suicide Potential Index on the Personality Assessment Inventory in a large, nontreatment sample of male and female federal inmates (N = 1,120). The data indicated robust validity support for both the Suicide Ideation Scale and Suicide Potential Index, which were each correlated with a broad group of validity indices representing multiple assessment modalities. Recommendations for future research to build upon these findings through replication and extension are made.

Keywords

suicide ideation, inmates, prisons, corrections

The detection of suicidal ideation and prevention of inmate suicide is an enduring challenge for criminal justice systems and professionals. Inmate suicide rates are larger than for the general population (Haycock, 1991; Konrad et al., 2007; Mumola, 2005). For corrections staff involved in the daily custody and care of inmates, the stakes are high. There is always a pressing need for instruments that can effectively identify inmates who present a risk due to the presence of suicidal ideation. Given the number of inmates requiring screening and assessment, such instruments could help clinicians who struggle to balance large caseloads with this most important aspect of their daily work (American Correctional Association, 2003; Ax et al., 2007; Boothby & Clements, 2000; Fagan, Cox, Helfand, & Aufderheide, 2010; Hayes, 1995; Lohner & Konrad, 2007; Magaletta, Patry, Dietz, & Ax, 2007; Magaletta, Patry, Wheat, & Bates, 2008).

The suicide and self-harm literature has developed primarily through investigations with community samples. The most common correlates of suicidality are preadolescent social problems (e.g., loneliness and school absenteeism; Rojas & Stenberg, 2010), breakdown of social bonds (Shiner, Scourfield, Fincham, & Langer, 2009), and family history of completed suicide (e.g., Qin, Agerbo, & Mortensen, 2002). Factors related to lifetime mental health problems and current symptoms are also commonly observed—for example, complications stemming from

mental illness (e.g., Mann, 2003), depression and substance abuse (Douglas et al., 2004), hopelessness, social desirability (Holden, Mendoca, & Serin, 2009), recent (past year) violent behavior (Conner et al., 2001), and history of a serious prior suicide attempt (e.g., Rosen, 1976).

In large part, the available findings on suicidality and self-injurious behavior among community samples parallels findings drawn from studies on suicide among those involved in the criminal justice system (Fagan et al., 2010; Webb et al. 2011). For example, Palmer and Connelly (2005) found that depression and hopelessness were associated with suicidal ideation in a small sample of male inmates in the United Kingdom. In another U.K. study, Leese, Thomas, and Snow (2006) found a negative relationship between inmate engagement in purposeful activities and suicide. Sarchiapone et al. (2009) reported on suicidal ideation and behavior in a large sample of inmates from Italy. They found a number of factors suggesting relationships to suicidality (ideation and/or behavior), most notably history of childhood trauma, and also history of substance abuse,

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aggression, depression, psychoticism, and neuroticism. In the United States, Bonner (2006) found that stress associated with housing in segregation was associated with hopelessness, prior suicide attempt lethality, and history of mental problems.

Although a number of studies have examined suicide in prison, there has been little work on instruments to screen inmates. The literature is replete with calls to train staff in identifying suicidal inmates, however many of the available instruments have not been validated within a corrections population. The lack of valid instruments for assessing aspects of suicide potential in correctional settings is a clear challenge given that early screening for suicide risk has been demonstrated to have clear potential for effectively attenuating inmate suicide attempts (Daigle, Labelle, & Côté, 2006; Gallagher & Dobrin, 2005; Lohner & Konrad, 2006).

There is high pragmatic potential for the use of a single psychometric instrument at intake, which includes a valid suicide ideation element in addition to other clinically useful measures, such as the Personality Assessment Inventory (PAI; Morey, 2007). Though it was not intentionally designed for use in correctional settings, the PAI has become a popular tool among clinicians and researchers who work with and study inmate populations. Recent interest in using the PAI among criminal justice practitioners is supported in several ways. The measure has strong psychometric properties. It is brief, inexpensive, and normed to a fourth grade reading level. Finally, it provides normative comparisons for community and clinical populations; corrections norms for the instrument are emergent (e.g., Boone, 1998; Edens & Ruiz, 2005; Morey & Hopwood, 2004).

Since the original publication of the corrections norms in 2005, a number of studies have examined the psychometric properties and clinical utility of the PAI in correctional contexts (e.g., Boccaccini, Murrie, Hawes, Simpler, & Johnson, 2010; Diamond, Harzke, Magaletta, Cummins, & Frankowski, 2007; Diamond & Magaletta, 2006; Drapalski, Youman, Stuewig, & Tangney, 2009; Edens & Ruiz, 2008; Fernandez, Boccaccini, & Noland, 2008; Magyar et al., 2012; Patry, Magaletta, Diamond, & Weinman, 2011; Ruiz, Douglas, Edens, Nikolova, & Lilienfeld, 2012; Skopp, Edens, & Ruiz, 2007). Several other scholars have illustrated how the instrument can be used to effectively inform elements of practice within corrections (Douglas, Belfrage, Herbozo, Poythress, & Edens, 2006; Douglas, Hart, & Kropp, 2001; Duellman & Bowers, 2004; Edens, Cruise, & Buffington-Vollum, 2001; Edens & Ruiz, 2005; Morey & Quigley, 2002). Collectively, this growing body of research supports the broad-based utility of the PAI in correctional populations, yet more research into high risk areas, such as suicide prevention is needed.

Of importance for the current work is a PAI treatment scale tapping suicide ideation. The PAI Suicidal Ideation Scale (SUI) has been found to relate to other self-report measures of suicidal ideation, as well as suicide precaution status among clinical samples (Morey, 2007). The scale measures thoughts about suicide along a range of severity, and provides the starting point for evaluating suicide potential on the PAI (Morey, 2003). Many individuals who commit suicide communicate their intentions beforehand. Thus, this scale could serve an important first step in corrections based suicide prevention efforts.

Hopwood, Baker, and Morey (2008) found support for the validity of the suicide measures on the PAI in a study of forensic inpatient substance abusers. They reported that both the SUI and the Suicide Potential Index (SPI), an aggregate index that pulls from several additional risk-related PAI scales, were each associated with a history of suicide attempts. Use of the SUI scale with other forensic samples has also begun to appear in psychopathy studies (e.g., Douglas et al., 2008; Douglas et al., 2006).

Two additional studies have specifically examined the validity of the SUI scale within corrections specific samples. In 1998, Rogers, Ustad, and Salekin examined SUI in a sample of 80 males who were emergency mental health referrals at a jail in Texas. The researchers used several measures, collected at point of entry to the mental health service unit, to examine and report on the convergent validity of the PAI SUI scale. Evidence for the convergent validity of the SUI scale included a strong correlation with the suicidal symptoms scale from a semistructured clinical interview (Schedule of Affective Disorders and Schizophrenia; Spitzer & Endicott, 1978). The SUI scale also showed good convergent validity with the suicidal ideation scale from the Suicide Probability Scale (Cull & Gill. 1982). This study also illustrated strong evidence for the incremental validity of the SUI scale for predicting total scores on the Suicide Probability Scale over and above the PAI Depression scale.

In the other published study of the utility of the PAI SUI scale with inmates, Wang et al. (1997) found it to be a strong measure of suicidality among a host of other measures in a sample of 334 inmates seeking or receiving treatment in a correctional based inpatient psychiatric hospital unit. The primary validity criteria included institutional measures, such as the number of nonlethal suicidal behaviors and previous suicide risk assessments. Congruent with a key feature of the seminal Hopwood et al. (2008) study, Wang and colleagues (1997) also examined the SUI scale alongside the SPI. This was an important feature as the SPI involved indicators from PAI scales other than SUI that reflect suicide risk factors. The idea of SPI is that, while it should not converge as well as SUI with other suicide measures or behaviors, it should provide incremental information because it measures risk factors. Of note, the authors reported clear indications that the SUI scale was found to be a better measure of suicide potential. This point was iterated

in the review conducted by Morey and Quigley (2002). Although the support in available literature on the use of the SPI is not as strong as the literature on the SUI, combined with the more rigorous findings on the validity of SPI in the Hopwood et al. (2008) study, with forensic inpatient substance abusers, further exploration of the SPI is warranted.

These studies provide initial support for use of the SUI scale with inmates, yet limitations remain and more work is needed. For example, each has used treatment samples of inmates (i.e., inmates who had significant psychiatric concerns in addition to treatment need). Thus the validity of the SUI scale in a general inmate population remains unknown. Also, these studies utilized male-only samples. To date there has not been a study which investigates the utility of the SUI scale, or the SPI, in a general, nonclinical inmate sample including females and males.

Thus, the purpose of present study is to replicate and extend prior research by examining the validity of the PAI SUI and the SPI with a large, nonclinical sample of male and female federal inmates using other current and lifetime mental health indices. The present research extends the scope of prior studies by employing a broad set of validity indices that vary across assessment modality (offender self-report; clinician interview; verified medical diagnosis); construct tapped (symptom, diagnosis, behavior); and time-frame (past 2 weeks, current, and lifetime). This represents a comprehensive approach to establishing the convergent validity of the SUI scale and the SPI within a general corrections context.

Method

Participants

Participants in this study were 1,120 newly committed federal inmates. The average age was 33.85 years ($SD = 9.4$). The vast majority (92.5%) were U.S. citizens. A quarter of participants were females ($n = 289$). Nearly half the sample (44.2%, $n = 484$) was African American, a third was White ($n = 364$), 17% ($n = 183$) were Hispanic, and 6% ($n = 63$) were other ethnicities ($n = 26$ were missing ethnicity data). Highest education levels were as follows: 31% ($n = 336$) had some college or vocational school, 36% ($n = 387$) had completed high school, 28% ($n = 305$) had some high school, and 6% ($n = 62$) had education of eighth grade or less ($n = 30$ were missing education data). Forty percent had never married ($n = 421$), 38% ($n = 398$) were married or in common law marriages, and 22% ($n = 235$) were divorced, separated, or widowed ($n = 34$ were missing marital status data). For security level, 22% ($n = 241$) were high security, 26% ($n = 289$) medium, and 53% ($n = 590$) were low security inmates. See Table 1 for additional inmate demographics. This sample is very similar to the demographics profile of the corrections sample reported by Edens and Ruiz (2005).

Table 1. Sample Demographics.

Variable	Percentage (*n*)	Valid *n*
Sex		1,120
Male	74.2 (831)	
Female	25.8 (289)	
Marital status		1,054
Married/common law	37.7 (398)	
Divorced/separated/widowed	22.3 (235)	
Never married	39.9 (421)	
Number of children		1,086
None	23.2 (252)	
1	20.5 (223)	
2-3	38.4 (417)	
≥4	17.9 (194)	
Education		1,090
Eighth grade or less	5.7 (62)	
Some high school	28.0 (305)	
Completed high school	35.5 (387)	
Some college/vocational school	30.8 (336)	
Race/ethnicity		1,094
African American	44.2 (484)	
White	33.3 (364)	
Hispanic	16.7 (183)	
Other	5.8 (63)	
Security level		1,120
Low/minimum	52.7 (590)	
Medium	25.8 (289)	
High	21.5 (241)	

Procedure

The present study draws on data from the Federal Bureau of Prison's Mental Health Prevalence Project (Diamond & Magaletta, 2006; Magaletta, Diamond, Faust, Dagett, & Camp, 2009, Patry et al., 2011). The study employed a multifaceted measurement approach including operational data and other psychological measures. The data was collected over an 18-month period, during which newly committed inmates were sampled from 14 different federal facilities across 5 geographic regions and 3 different security levels. Using a nonprobability continual sampling strategy, the data were collected for a sample of 2,855 inmates who were fluent in either Spanish or English. Among the total sample, 1,692 consented to a series of tests which included the PAI; this subsample was the basis for the present study. The federal institutional review board approved the study and participants were offered no incentives.

As recommended by Morey (2007), PAI profiles were screened for aberrant scores on the Inconsistency (ICN) and Infrequency (INF) scales of the PAI. This was done to eliminate participants who were inattentive or responded inconsistently to the PAI scale items; 217 participants scored beyond the recommended range (i.e., *T*-score of 73 or

higher) on ICN, and 255 inmates scored above the recommended range for INF (*T*-score of 75 or higher). Because prior research indicates that Spanish-language version of the PAI may not be psychometrically equivalent to the original English-language PAI (Fernandez et al., 2008; Rogers, Flores, Ustad & Sewell, 1995), only English-speaking participants were selected for the current study; the original sample included 325 Spanish-speaking inmates who chose to complete the instrument in Spanish. Data were omitted from the present study when participants who met one or more of the exclusion criteria, that is, out-of-range scores on ICN or INF, or completion of the Spanish language PAI.

Measures

There were five sources of data used for this study. The first three are operational measures used to form the psychological services intake screening process. These measures will be presented to follow this general organizational framework: self-report inmate intake data, official intake data produced through a clinical interview with doctoral-level psychology services staff, and finally, data coded from official pre-sentence investigation reports on inmate background.[1] There was no overlap between the PAI data and the other data sources; the battery of tests which included the PAI was not available to intake staff.

The *Psychological Services Intake Questionnaire (PSIQ)* consists of a two-page inmate self-report measure is composed mainly of yes/no questions on a host of variables including mental health and substance use histories (for 2-year period prior to incarceration), physical and mental health symptoms (over the past 2 weeks), current or past treatment for substance abuse and mental illness, as well as history of suicide attempts or ideation (Federal Bureau of Prisons, 1993). Variables from the PSIQ in the present study included the following five validity indices: *Ever Considered Suicide* in the past; *Ever Received an Incident Report*; and *Endorsing feelings of Nervousness* (yes/no) during the past 2 weeks, *Depression* (yes/no) during the past 2 weeks, and *Hopelessness* (yes/no) during the past 2 weeks.

The *Psychology Intake Interview* from the *Psychology Data System (PDS)* is one of the electronic mental health records on file with Federal Bureau of Prisons. The data were gathered by a licensed or license-eligible doctoral-level psychologist, or a psychology graduate student working under the supervision of such a psychologist. In advance of conducting the interview, the staff reviewed all available inmate records. Thus, the intake interview data result from synthesis of a clinical interview, clinical judgment, and available record information. Variables from the PDS intake data in the present study included the following four validity indices: *Any Prior Suicide Attempts; Any Significant Mood/Affective Features; Any Substance Abuse History*; and *Diagnosis of Axis I Polysubstance Dependence*.

Pre-Sentence Investigation (PSI) reports are ordered by a judge and compiled prior to sentencing. An investigation is conducted by a probation officer according to a prescribed format including an in-depth interview with the defendant, the information from which is later corroborated via consulting official records and through additional contact with family members and others who know the defendant. PSI reports were subjected to detailed coding protocol called the Pre-Sentence Investigation Coding Form (PSI-CF), resulting in a host of inmate characteristics measured from a lifetime perspective. Following an intensive two-day training session, Mental Health Prevalence Project coders using the PSI-CF were certified by achieving a minimum of 90% agreement across 10 individual gold standard coding protocols. These gold standard protocols represented increasing levels of coding difficulty. Variables from the PSI coding used in the present study included the following four validity indices: *Any Mention of Suicide in the Inmates Family, A Verified Diagnosis of Depression as an Adult*, A *Verified Diagnosis of an Anxiety Disorder as an Adult*, and A*ny Lifetime Record of Occurrences of Self-Harm*.

The *Personality Assessment Inventory (PAI)* is a personality measure consisting of 22 nonoverlapping scales made up of a total of 344 items (Morey, 2007). There are 11 scales for measuring personality, mood, and anxiety symptoms, 5 scales for measuring amenability to treatment, 2 interpersonal scales, and 4 validity scales for identifying malingering or dishonest responding (Morey, 2007). In addition to use of the INC and INF scales mentioned in the procedure section above, the remainder of the analysis employed both the SUI scale and the SPI. SUI measures suicidal ideation through items ranging from hopelessness to concrete plans and thoughts of suicide. The Suicide Potential Index (SPI) is a composite index derived from 20 different indices on the PAI; raw scores range from 0 to 20. The scales included in the SPI are as follows: ALC (Alcohol Problems); DRG (Drug Problems); STR (Stress), NON (Nonsupport); WRM (Warmth); SOM-H (Somatic Complaints-health concerns); ANX-C (Anxiety-Cognitive); ANX-P (Anxiety-Physiological); ARD-O (Anxiety-Related Disorders-Obsessive Compulsive); DEP-C (Depression-Cognitive); DEP-A (Depression-Affective); DEP-P (Depression-Physiological); MAN-A (Mania-Activity Level); MAN-G (Mania-Grandiosity); PAR-H (Paranoia-Hypervigilance); SCZ-T (Schizophrenia-Thought Disorder); BOR-A (Borderline Features-Affective Instability); BOR-N (Borderline Features-Negative Relationships); BOR-S (Borderline Features-Self Harm); AGG-A (Aggression-Aggressive Attitude) minus AGG-V (Aggression-Verbal Aggression).

SENTRY is an operations specific database containing official demographic and criminal history terms. For the current study this database was used to extract the demographic data used to describe the sample.

Table 2. Bivariate and point-biserial correlations between SUI and SPI with each of the validity indices.

Indicator variables (source)	% of sample (n)	SUI		SPI	
		R_{pb}	R_{pr}	R_{pb}	R_{pr}
Ever Considered Suicide (PSIQ)	6.6 (74)	.28*	.21*	.20*	.06
Received Incident Report (PSIQ)	7.1 (79)	.02	−.01	.05	.05
Nervousness (PSIQ)	23.8 (267)	.21*	.08	.26*	.18*
Depression (PSIQ)	22.8 (255)	.30*	.18*	.30*	.17*
Hopelessness (PSIQ)	9.2 (103)	.26*	.18*	.22*	.09*
Any Suicide Attempts (PDS)	10.0 (112)	.35*	.27*	.25*	.07
Significant Mood/Affect (PDS)	6.6 (74)	.12*	.02	.18*	.14*
Substance Abuse History (PDS)	74.1 (830)	.05	−.08	.20*	.21*
Axis I Polysubstance Dependence (PDS)	52.5 (588)	−.04	−.07	.07	.10*
Any Mention of Suicide in Inmates Family (PSI)	1.1 (12)	−.01	−.01	−.01	.00
Diagnosis of Adult Depression (PSI)	10.0 (112)	.20*	.14*	.15*	.05
Diagnosis of Adult Anxiety Disorder (PSI)	2.6 (29)	.08	.03	.10*	.07
Occurrences of Self-Harm (PSI)	1.4 (15)	.12*	.10*	.07	.00

Note. R_{pb} = point-biserial correlation (bivariate); R_{pr} = partial correlation (controlling for SUI or SPI). PSIQ = Psychological Services Intake Questionnaire; PDS = Psychology Intake Interview from the Psychology Data System; PSI = Pre-Sentence Investigation; SUI = Suicide Ideation Scale; SPI = Suicide Potential Index.
*$p \leq .005$.

Results

The thirteen validity indices in the present study were conceptually related to suicide risk, and represented a broad range assessment modalities, clinical constructs, and time-frames. These validity indices were entered into a correlation matrix with SUI and SPI (see Tables 2 and 3). The correlations from this procedure revealed significant and nonsignificant relationships between both SUI and SPI, and indicator variables from each of the three main data sources (PSIQ, PDS, and PSI). All significant relationships were in the expected direction. Table 2 includes descriptive data for each of the correlate variables.

Bivariate point-biserial correlations between SUI and SPI with each of the validity indices are presented in Table 2. Partial correlations controlling for the other PAI measure (SUI or SPI) are also presented in order to test for incremental validity and areas where correlations to the SUI scale and the SPI index differ. These partial correlations are presented to give a clearer sense of unique relationships between each PAI measure and the validity indices because of the high level of covariance between the SUI and SPI: r (1120) = .536, $p < .001$. Given the number of correlations and corresponding possibility of inflated Type I errors, a conservative criterion of $p \leq .005$ was used to determine statistical significance.

Together, there were *8* validity indices that showed significant point-biserial correlations with the SUI scale. These variables included all of the self-report PSIQ variables with the exception of ever having received incident reports. The self-report suicide ideation variable "Ever Considered Suicide", as well as the three symptoms experienced during the past 2 weeks: Nervousness, Depression, and Hopelessness all demonstrated significant relationships to SUI. There were another two variables from the clinical interview indicated in the PDS intake that demonstrated a significant relationship to SUI: Lifetime History of Suicide Attempts and Presence of Significant Mood/Affective Features. Interestingly, substance abuse, either as a history or in the form of Polysubstance Dependence did not demonstrate significant raw bivariate relationships to SUI. Finally, concerning the PSI the verified medical diagnostic variables for Depression and lifetime history of Self-Harm behaviors demonstrated significant relationships with SUI. Controlling for variance associated with the SPI, partial correlations showed that all of the relationships above were still significant, except for Mood/Affective Features from the PDS.

The pattern of relationships between validity indices and the SPI was very similar to those observed with SUI, except that SPI was also associated with Substance Abuse History and Axis 1 Polysubstance Dependence from the PDS, as well as Adult Depression and Anxiety Disorder diagnoses; in addition, Occurrences of Self-Harm from the PSI were not related to SPI. All partial correlations were smaller, but remained significant when controlling for variance associated with SUI, except for Ever Considered Suicide from the PSIQ, Suicide Attempt history from the PDS, and Diagnosis of Adult Depression.

Next, we generated simultaneous entry linear regression models using the thirteen validity indices to predict SUI and SPI scores (independent models). For SUI, the overall model accounted for 21% of the variance, $R(14, 1104) = .458$, $p < .001$; and the explained variance in SUI reached

Table 3. Simple Bivariate Correlations.

	A	B	C	D	E	F	G	H	I	J	K	L	M
Ever Considered Suicide (PSIQ) (A)	—												
Received Incident Report (PSIQ) (B)	.00	—											
Nervousness (PSIQ) (C)	.24*	.02	—										
Depression (PSIQ) (D)	.28*	−.03	.52*	—									
Hopelessness (PSIQ) (E)	.21*	−.03	.32*	.48*	—								
Any Suicide Attempts (PDS) (F)	.59*	−.01	.20*	.21*	.19*	—							
Significant Mood/Affect (PDS) (G)	.10*	.00	.21*	.18*	.15*	.12*	—						
Substance Abuse History (PDS) (H)	.01	−.02	.02	.02	.00	.05	.04	—					
Axis I Polysubstance Dependence (PDS) (I)	−.02	−.07	−.03	−.03	−.03	−.04	−.09*	.61*	—				
Any Mention of Suicide in Inmates Family (PSI) (J)	.01	.01	−.04	−.04	−.03	−.04	.01	.00	−.02	—			
Diagnosis of Adult Depression (PSI) (K)	.16*	.00	.19*	.17*	.10*	.21*	.10*	−.01	−.03	−.01	—		
Diagnosis of Adult Anxiety Disorder (PSI) (L)	.03	−.05	.15*	.13*	.05	.04	.09*	−.09	.00	−.02	.34*	—	
Occurrences of Self-Harm (PSI) (M)	.04	.08	.05	.01	.05	.10*	−.01	.00	.01	−.01	.06	.02	—

Note. PSIQ = Psychological Services Intake Questionnaire; PDS = Psychology Intake Interview from the Psychology Data System; PSI = Pre-Sentence Investigation.
*$p \leq .005$.

37% when SPI was added to the model at a second step, $R(15, 1104) = .611$, $p < .001$. Five of the 13 indicator variables showed unique relationships to SUI when controlling for all of the other variables in the model including SPI: depression in past 2 weeks (PSIQ), hopelessness in the past two weeks (PSIQ), prior suicide attempts (PDS), verified diagnosis of Depression as an adult (PSI), and prior occurrence of self-harm (PSI). For the SPI the overall model accounted for 20% of the variance, $R(14, 1104) = .442$, $p < .001$; and the explained variance in SPI reached 36% when SUI was added to the model at a second step, $R(15, 1104) = .599$, $p < .001$. Four indicator variables showed unique, positive relationships to SPI when controlling for the other variables in the model (including SUI): self-reports (PSIQ) of having Received an Incident Report, and also Depression in the last two weeks, and presence of Mood/Affective symptoms and Substance Abuse History (PDS). It is noteworthy that there is no overlap between the unique indicator variables related to SUI and SPI, except for the self-reported symptom, "Depression" from the PSIQ.

Discussion

Our findings indicate strong support for the convergent validity of the SUI scale and the SPI in a general correctional setting, across security levels and with both male and female inmates. Taken together, the results from the bivariate and partial correlations, and the regression analyses, show that the variance captured by SUI and SPI is multifaceted. The data generally support the construct validity of both the SUI scale, and the SPI. Though there is predictably substantial overlap between the indictor variables' associations to SUI and SPI the regression models show that these two measures capture different domains of information.

SUI showed robust, unique relationships with demonstrated indicators of suicidality from multiple measurement domains including self-reported inmate depression and hopelessness, prior suicide attempts documented by psychologists during intake interviews, and verified diagnosis of Depression as an adult and occurrences of self-harm from presentence investigation reports. Given the preliminary findings of earlier studies with male inmate treatment populations, this replication in a nontreatment sample of male and female inmates is reassuring.

Perhaps what is most noteworthy about the present study is the robustness of the SUI validity across multiple indicators representing different combinations of assessment modalities and constructs. Self-reported feelings of hopelessness experienced in the past two weeks were uniquely related to SUI. Additionally, two different measure of depression showed unique, positive relationships with SUI: self-reported symptom of depression as measured on the PSIQ, and verified diagnosis of Depression as an adult measured on the PSI. Documented occurrence of self-harm, measured and coded from the PSI, was also uniquely related to SUI.

Turning to the SPI, the data show unique associations between several indicator variables that were not related to SUI in the regression analysis: self-reported incident reports, clinician-reported intake interview presence of significant mood/affective symptoms, and substance abuse history. This demonstrates the incremental validity of the SPI. The variance captured by this composite index varies significantly from the SUI and suggests that valuable information about suicide risk can be gained through the combined use of both SUI and SPI.

An interesting feature of the overall findings is that when controlling for other related measures, Ever Considered

Suicide and Anxiety-Based Symptoms or Lifetime Diagnosis each failed to demonstrate a unique relationship to SUI. This is a reminder of a central challenge to suicide research. The use of singular constructs (e.g., ideation) is essential to building sound psychometric studies but can mask the complexities involved in researching the process of suicide.

It is imperative to remember that the behavioral, cognitive, and affective components, together with features of an individual inmate's environment through time, all influence suicide risk and its prediction. For example, Nock, Hwang, Sampson, and Kessler (2010) determined a strong link between depression and suicide ideation. However, when the researchers disaggregated the conceptualization of suicide to examine behaviors such as suicide ideation to include measurement of plans and attempts, this link with depression was attenuated. Moreover, it was found that anxiety disorders and substance abuse, factors demonstrating unique relationships in the present study with SPI, predicted which individuals went on to plan or attempt suicide. Thus, it would appear that unique associations form with certain symptoms or disorders and the multifaceted series of suicide constructs, from suicide ideation to suicide attempt to completed suicide, and that each construct requires individual and combined empirical study.

A few words on the assessment modalities used in this study are in order. Self-reported recent feeling of depression at intake (PSIQ) and verified diagnosis of Depression as an adult (PSI) were each simultaneously, uniquely related to SUI (i.e., controlling for one another). Although we used these indicators to validate the SUI in the present study, the assessment modalities themselves are important for two additional reasons. First, they emphasize the significance of a brief list of self-report clinical items at intake in terms of informing potential suicidal ideation. Second, clinicians should not underestimate the utility of these brief items to inform their clinical interview. Affirmative responses to such items always warrant further assessment and deeper levels of inquiry by the interviewer. This is particularly true during the intake screening process when an inmate is being introduced to the general population at a new facility.

Additionally, from a clinical standpoint the use and importance of the indicators tapping a mix of timeframes and constructs highlight the fluid nature of suicide risk through time. Our findings, including those for prior behaviors, prior diagnosis and symptoms over the past 2 weeks suggests just how important it is for clinicians to think broadly about suicide risk and to conceptualize it through time. Although ours is a psychometric validity study of a scale and an index from the PAI, it is worth noting that the variables demonstrating significant relationships during the simultaneous regression modeling do map nicely upon the fluid vulnerability theory presented by Rudd (2006). This theory can be used by correctional clinicians interested in studying and applying

timeframes to differentiate acute and chronic risk. Of critical importance, the combined acute (2-week symptoms) and chronic risk variables (Depressive Disorder) that demonstrated unique relationships to SUI means that the scale itself may prove useful in screening individuals with both acute and chronic risk factors for suicide.

Although this study benefited from a large nonclinical sample with multiple measures, it was not without limitations. A primary limitation concerns generalizability of the findings. It is important to recognize a fundamental difference between long-term prison inmates and shorter term jail inmates. While correctional terminology and definitions vary greatly around the world (Daigle et al., 2007; Konrad et al., 2007), it is clear that suicide risk is far higher with short-term (jail) inmates as compared to the longer-term (prison) population (Nicholls, Lee, Corrado, & Ogloff, 2004). In addition, distinctions are also drawn out between general population inmates, and those who are in specialized programs or housing units such as segregation. The present study focuses on suicidal ideation in sentenced prison inmates in general population with the Federal Bureau of Prisons. Although findings should logically generalize to similar correctional facilities in the United States and abroad, they are not likely to generalize to special units or systems which house shorter term or pretrial inmates, for example, jails or detention centers. Another limitation is that validity indicators in the present study, while broad, also lacked depth in certain key areas. For example they were unable to inform nonlethal and potentially lethal plans for suicide and they did not tap impulse control disorders.

In addition, although there are benefits to the SUI and SPI—including items constructed at the fourth grade reading level and the use of unambiguous language concerning thought of suicide—the measures are not without fault. Like many such measures, those wishing to disguise their ideation may do so on these items. Furthermore, from a risk management perspective, the SUI scale is just one of several scales that could be used to detect problems that link to suicide risk in an inmate population. The present study also provides strong support for the SPI, including incremental validity present through its use in combination with SUI. Although many other scales—even ones from the PAI—could be examined as indicators of suicide risk, the current study was rooted in the belief that an initial, parsimonious approach focused on the SUI scale and the SPI was a necessary first step in this overall direction.

Despite these limitations, the present study illustrates clearly that suicidal ideation generally, and specifically as measured by the SUI scale and the SPI, is valid for screening and assessing suicide ideation in the correctional setting with male and female offenders. However, it is important to note that the clinical process of establishing suicide risk at a given time is quite different from what a psychometrically valid scale might tell a clinician. In short, although SUI and

SPI are valid indicators of suicidality, these measures are no substitute for a solid clinical interview with a doctoral level clinical or counseling psychologist.

With the convergent validity of the SUI scale and the SPI firmly established, their predictive validity can be explored in future psychometric research. Given that the current sample represents an incoming cohort of inmates, there would be substantial benefit to applying a longitudinal, predictive model with the present data. More specifically, the prospective mental health psychological service trajectory of inmates with higher and lower ideation scores may allow a deeper understanding of how comorbidities influence the lethal and nonlethal outcomes of various suicide constructs, including risk levels, suicide ideation, plans, and attempts during and even after incarceration.

Future research should also consider prior incarcerations, aggression, and multiple versus singular suicide attempts in predicting inmate suicide risk (Fazel & Benning, 2009; Nichols et al., 2004). Of course, given the high degree of substance use disorders observed in inmate population, co-occurring substance abuse and mental health problems (Ruiz et al., 2012) also merit further examination. Finally, further research on predictive validity of the PAI will further elaborate its utility in corrections. For example, predictive utility with respect to nonlethal behavior and suicide attempts, as well as a host of other institutional measures (e.g. clinical service usage), enrollment in and completion of educational programs, violence against other inmates, and criminal recidivism, may all be worth pursuing.

There is a clear need for suicide risk screening instruments for use with general inmate populations which have been validated with large correctional samples. This study begins to address that need. The literature on inmate self-injurious behavior is fraught with challenges, including poorly defined and overlapping outcomes (e.g., nonsuicidal deliberate self-harm vs. suicide attempts) and methodological weaknesses, yielding fragmented and contradictory findings (Lohner & Konrad, 2007). There is high pragmatic potential for the use of a single psychometric assessment instrument at intake, which includes a valid suicide ideation element in addition to other clinically useful measures, such as the PAI. We add the support of this study to the growing evidence of instruments developing toward this aim.

Authors' Note

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Note

1. For this study, we examined sex differences and while the PAI variables used in this study showed small sex differences, the magnitude of the differences were small and less than the .22 threshold noted by Morey (2007) and utilized by Edens and Ruiz (2005). Therefore, the male and female data were combined, consistent with the approach taken in prior research.

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