



Evaluating chronic suicide risk with the Personality Assessment Inventory: Development and initial validation of the Chronic Suicide Risk Index (S_Chron)



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ABSTRACT

The current study sought to develop and validate a new measure of chronic suicide risk (the *S_Chron*) from the Personality Assessment Inventory in a mixed sample of psychiatric inpatients and outpatients. In an initial development sample ($N=397$), hierarchical logistic regression identified six PAI variables uniquely associated with multiple versus single/no prior suicide attempts after controlling for sample demographics: Negative Impression Management, Situational Stress, Mania – Grandiosity, Borderline – Negative Relationships, Borderline – Self-Harm, and Antisocial Behaviors. These indicators were then aggregated into a single index (*S_Chron*) and evaluated in terms of validity in an independent clinical sample ($N=398$). Results indicated the *S_Chron* effectively differentiated between groups with multiple versus single/no prior suicide attempts, even after controlling for the effects of the PAI Suicidal Ideation (SUI) and Suicide Potential (SPI) indices, with moderate to large effect sizes observed (range of Cohen's d 's = 0.30–0.91). Further, the *S_Chron* incremented all other PAI indices and SUI in predicting multiple suicide attempts. The potential clinical application and ways in which the *S_Chron* may augment other existing measures of suicide risk are discussed.

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1. Introduction

Suicide remains among the leading causes of death in the United States and worldwide, and in many ways represents a public health crisis that is complex and still not well understood. According to the most recent data provided by the Center for Disease Control and Prevention (CDC), it ranked as the tenth leading cause of death in the United States for all ages and accounted for 41,149 total mortalities in 2013 (CDC, 2015). For those between the ages of 15 and 34, suicide ranks as the second leading cause of death (with unintentional injuries topping the list). Historically, the study of suicide in the social sciences has been complicated by a variety of factors, including the low base rates of completed suicide in the general population, which makes more complex, multivariate statistical prediction difficult to achieve; as well as differences in the specific populations under study (i.e.,

clinical versus non-clinical samples, differentiating self-injury from attempted suicide, lethal versus non-lethal attempts, etc.) – all of which has resulted in variable findings. Despite this, in recent years a number of large epidemiological and clinical research studies have begun to provide valuable insights into risk factors for suicide.

For example, in a prospective psychological autopsy study of 6891 psychiatric outpatients, Brown et al. (2000) identified 49 (1%) patients who had completed suicide through the National Death Index. Multivariate analyses indicated that major depressive and bipolar disorders, unemployment status, and suicidal ideation were among the strongest risk factors for subsequent suicide. In addition, a prior history of suicide attempts and psychiatric hospitalization also uniquely contributed in predicting subsequent suicide.

Using a slightly different (retrospective) design involving a nationally representative sample of United States adults from the National Comorbidity Survey Replication, Nock and colleagues (2010) found that roughly 80% of those with a history of suicide attempts had a prior psychiatric disorder. Specifically, anxiety,

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mood, impulse-control, and substance use disorders were all found to be significant predictors of subsequent suicide attempts. Interestingly, these effects decreased somewhat when the models were adjusted for comorbidity, although were still statistically significant. However, when these relationships were disaggregated across specific sub-groups (i.e., those with suicidal ideation, plans, and attempts), results indicated that depression was the strongest predictor of suicidal ideation, but not of suicide plans or attempts. Rather, anxiety and impulse control disorders were the best predictors of suicide plans and attempts (especially unplanned attempts).

While valuable, the majority of previous research on suicide has typically categorized all attempters as one aggregate entity, as compared to groups with no history of attempts (Forman et al., 2004). However, as other researchers have noted, a past history of suicide attempts increases the likelihood of future attempts and ultimate completion substantially, highlighting the important clinical role that chronicity may play in risk assessment (Boisseau et al., 2013). According to Yen et al. (2011), those who have attempted suicide in the past are 38 times more likely to complete suicide in the future, as compared to the general population. The relative public health burden for this more chronic group has been found to be considerable, both in terms of medical costs and lost productivity (Yen et al., 2011). From a clinical perspective, emerging research has also begun to demonstrate how those who have made multiple suicide attempts in their lifetime represent a unique group in terms of severity and comorbidity of underlying psychopathology, as compared to those who have made only one or no attempts (Boisseau et al., 2013; Forman et al., 2004; Joiner and Rudd, 2000; Pagura et al., 2008;). This line of research has recently been replicated in cultures outside of the United States (see Choi et al. (2013)).

Rudd and Joiner (1996) are among the first to have explored clinical differences between groups with histories of single (SSA) versus multiple suicide attempts (MSA), and demonstrated that the latter tend to be more severe in terms of underlying psychopathology and level of hopelessness, as well as complex in terms of personality pathology. A number of recent studies have yielded similar findings, suggesting that those with histories of multiple suicide attempts tend to present with higher levels of psychiatric comorbidity and symptom acuity (Boisseau et al., 2013; Choi et al., 2013; Forman et al., 2004; Pagura et al., 2008). For example, Pagura et al. (2008) evaluated clinical differences between SSA and MSA groups in two large nationally representative samples drawn from the United States, and found that comorbidity of three or more psychiatric disorders and the presence of at least one anxiety disorder differentiated the MSA from the SSA group. Likewise, Forman et al. (2004) examined differences between SSA and MSA groups in a sample of patients presenting to an urban hospital emergency room following a suicide attempt, and again found that severity of psychopathology coupled with abuse history, poorer interpersonal functioning, and suicidal ideation differentiated the two groups. Boisseau et al. (2013) sought to extend this research in a large longitudinal study of people with personality disorders, and found that while there were no differences between SSA and MSA groups in terms of Axis I disorders, multiple attempters were more likely to meet criteria for Borderline Personality Disorder and be prone to higher levels of impulsivity.

Similar findings have also been noted in non-western cultures. For example, in a sample of individuals presenting to an emergency room in South Korea following a suicide attempt, Choi et al. (2013) noted that the MSA group tended to be more severe in terms of underlying psychopathology and interpersonal/social dysfunction, as compared to those presenting following their first attempt. Likewise, MSA groups were more likely to have had a family history of suicide, previously diagnosed Axis I and II

disorders, and higher levels of affective dysregulation.

Taken together, these findings have important implications for clinical practice more generally, and suicide risk assessment specifically. For example, they highlight the ways in which individuals with multiple suicide attempt histories (as compared to those with single or no prior suicide attempts) may be distinct in terms of their underlying clinical and personality characteristics – especially in terms of severity and comorbidity. Independent of whether someone is endorsing suicidal ideation upon interview, an appreciation of these clinical factors has the potential to incrementally improve risk assessment initially, as well as disposition and treatment planning prospectively (Glassmire et al., 2015). Likewise, this body of research provides a framework for evaluating risk above and beyond general distress and discrete suicidal ideation – particularly in populations who may be more chronically at risk, and who may require more intensive/comprehensive treatment planning.

In spite of these research advances, the majority of psychological tools to date have focused on singular constructs in assessing suicide risk, including whether someone is reporting active suicidal ideation, hopelessness, and/or intent in the immediate clinical encounter. For example, The Beck Hopelessness Scale (BHS) has been widely used in screening for potential suicide risk in light of research indicating that hopelessness is a strong long-term predictor of suicide (Beck, 1988). Other instruments including the *Suicide Intent Scale* (Beck et al., 1974) and *Suicidal Behaviors Questionnaire – Revised* (Osman et al., 2001) have also been developed in order to evaluate degree of suicidal ideation and intent. Lastly, the *Patient Health Questionnaire – 9* (PHQ-9) has also been used with increasing frequency as a means monitoring treatment outcome in depressed populations, and includes a single item asking about suicidal ideation that clinicians frequently use to gauge suicidality (Kroenke et al., 2001).

One exception to this is the Suicide Potential Index (SPI) from the Personality Assessment Inventory (PAI), which was developed by Morey (1991, 2007) as a means of identifying potential risk factors for suicide irrespective of whether someone is actively endorsing suicidal ideation upon interview. Specifically, Morey (1991) developed the SPI using a rational approach by identifying 20 PAI indicators (e.g., level of depression, affective instability, substance misuse, etc.) that have been found to be empirically associated with suicide in the scientific literature, and aggregating them into a single index based on whether these scales exceed certain threshold (e.g., a T-score of 60). While preliminary research on the SPI has been promising (Sinclair et al., 2012), the index was developed to evaluate for suicide risk more generally, and not for specific populations who may be at chronic risk for suicide. Given emerging research (summarized above) demonstrating that multiple suicide attempters may in fact represent a unique clinical sub-population with distinct clinical and personality characteristics, the SPI may not necessarily be optimal. As research in this area advances, risk assessment models must also evolve.

Broadband measures of psychological functioning including the PAI offer a number of advantages in evaluating for complex clinical phenomenon such as chronic suicide risk, given their ability to cover a wide array of relevant clinical domains (Morey, 1991, 2007). For example, Sinclair and colleagues (2013, 2014) recently developed an empirically-derived index from the PAI to assess level of care needs in psychiatric populations – the *Level of Care Index* (LOCI). Specifically, hierarchical logistic regression was used in a mixed psychiatric sample to identify unique PAI predictors of inpatient (versus outpatient) level of care (e.g., Negative Impression Management, Depression – Affective, Suicidal Ideation, Antisocial Personality – Stimulus Seeking, Paranoia – Persecution). These indicators were then aggregated into a single index and validated in a second mixed clinical sample – with promising

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