THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF PSYCHOLOGY

THE PREDICTIVE VALIDITY OF THE MCLEAN SCREENING INSTRUMENT FOR BORDERLINE PERONALITY

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SPRING 2016

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Psychology
with honors in Psychology

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Abstract

Purpose: Borderline personality disorder (BPD) is a highly prevalent, debilitating, and deadly disorder that is difficult to diagnose. As many as 1 in 10 individuals with BPD successfully commit suicide, thus identifying those with BPD is critically important. In the present study, we assess the predictive validity of the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD, Zanarini et al., 2003) for detecting BPD. Four indices were examined: positive predictive power (PPP), negative predictive power (NPP), specificity (SPE), and sensitivity (SEN). Methods: Two-hundred and thirty-nine individuals ages 18 to 60 (M= 27.5; S.D. = 10.07)) completed the MSI-BPD and the International Personality Disorder Examination (IPDE; Loranger, 1994). Results: Sixty-three participants (26.4%) met criteria for BPD on the IPDE. The kappa value for an MSI-BPD threshold of 5, 6, or 7 indicated moderate levels of agreement (Fleiss, 1981). The MSI-BPD showed excellent sensitivity with cut-off scores of 5 or 6 and weaker sensitivity with cut-off scores of 7 or 8. In contrast, its specificity increased as the cut-off increased. The positive predictive value ranged from 0.48 (cutoff of 5) to 0.56 (cut-off of 7). However, the negative predictive power was high for all cut-offs. Conclusion: The MSI-BPD can be an effective screening tool for detecting BPD. Our findings are generally consistent with the initial validation study for which a cutoff of 7 was recommended. However, we recommend a cut-off score of 6 as useful in a two-stage process to identify those likely to have BPD. When caseness is particularly important, a cut-off of seven may be preferred.

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ACKNOWLEDGMENTS

This thesis paper would not have possible without the support of some truly brilliant people. I am sincerely grateful for the guidance of my honors and thesis advisor, Dr. Kenneth Levy. He has dedicated countless hours to my academic, professional, and personal development over the past two and a half years and I attribute much of my success as scholar to his advice and direction. Even through some hard times, he believed I was capable of accomplishing great things in the future. I would also like to thank J. Wesley Scala, my graduate advisor, for his willingness to assist me during this entire project. He was a critical resource of knowledge and has been an excellent role model for all of the aspiring psychologists in the Levy Laboratory. The second reader of this paper, Dr. Jeffrey Love, deserves my greatest thanks as well for I truly appreciate his time and willingness to contribute to my experience of writing this thesis paper. Caroline Gooch and Ana Ross, both psychology leaders in the making, have provided me with emotional and logistical support and I am so thankful for all of the times they helped me keep track of deadlines, offer advice, and provide constructive feedback. Finally, I extend my gratitude and thanks to my family and closest friends. My lovely mother, father, and sisters have greatly influenced who I am today (for better or worse, but mostly better). I will always be proud to be your daughter and little sister and hope to live up to the Proszynski name.

All of these individuals have collectively given me confidence in my abilities and helped me to muster up the courage to pursue a doctorate in clinical psychology. Thank you all for inspiring the achiever in me.

Chapter 1

Introduction

Personality is at the crux of what it means to be human; it is the essence of what distinguishes us from other species (Millon et al., 2012). It impacts the ways in which one perceives the physical and social world, and subsequently how he or she relates to these environments. Healthy personality development not only increases ones dexterity in adapting to the psychosocial settings, but also results in the capacity for one to experience autonomy and intimacy as well (Blatt, Auerbach, & Levy, 1998). Yet this is not the case for a select group of individuals. In such contexts, personality may act as a deep-rooted infrastructure laying the groundwork for maladaptive mental health outcomes. Rigid and pervasive pathological traits impede upon one's ability to function at an optimal level across multiple settings, therefore making it exceptionally difficult to establish a sense of well being (American Psychiatric Association, 2013; Zimmerman et al., 2010).

The Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 1994; APA, 2013) categorizes ten clinically-recognized personality disorders using a cluster-based approach. Cluster A includes disorders with odd or eccentric qualities, such as paranoid, schizoid, and schizotypal personality disorders. Cluster B is comprised of disorders characterized by dramatic, emotional, or erratic behaviors. Antisocial, borderline, histrionic, and narcissistic personality disorders fall within this group, for example. The final cluster (cluster C) encompasses personality disorders with an anxious or fearful nature, which includes avoidant, dependent, and obsessive-compulsive personality disorders.

Epidemiological studies have found that approximately 9.1% of the United States population meets diagnostic criteria for having one of the DSM defined personality disorders (PD). Given the 2015 U.S. population of roughly 320 million (Census.gov, 2015), this equates to nearly 30 million Americans in a span of 12 months (Lenzenweger, Lane, Loranger, & Kessler, 2007; Tomko & Trull, 2014). One of the most prevalent and serious personality disorders is borderline personality disorder (BPD).

Studies have found prevalence rates between 1.5-6% in the general population, which makes it more prevalent than schizophrenia, bipolar disorder, and autism combined (Lenzenweger, Lane, Loranger, & Kessler, 2007; Kienast, Stoffers, Bermpohl, & Lieb, 2014). BPD also constitutes a high proportion of patients seen in outpatient (10-20%), and inpatients (25%-45%) treatments, making it one of the most common mental illnesses found in psychiatric facilities (Korekwa, Dell, Links, Thabne, & Webb, 2008; Zimmerman, Rothschild, & Chelminski, 2005; Levy, 2013; Widiger & Frances, 1989). These rates may reflect more conservative estimates as BPD is frequently under diagnosed and misdiagnosed.

Borderline personality disorder is perhaps the most perplexing of the PDs, characterized by chronic impulsivity, emotional instability, disturbances in identity, chronic feeling of emptiness, and an intense fear of real or imagined abandonment (Skodol et al., 2002; Zimmerman et al., 2010, APA, 2013; Levy, 2013). These behavioral and cognitive tendencies manifest in highly turbulent interpersonal relationships. BPD symptoms impact interactions in personal and occupational settings, but especially intimate relationships that exist with family members and romantic partners. Borderline patients often have trouble maintaining steady employment, partially due to poor affect regulation and outbursts towards co-workers or executives, for instance. Likewise, emotional instability towards significant others also has the

power to reinforce their extreme fear of abandonment insomuch that erratic behaviors may cause the partner to leave an individual with BPD (Gunderson, 2011).

Suicidality is the most serious symptom of BPD and occurs quite frequently for those with the disorder. Research has shown that about 70% of people with BPD will have at least one suicide attempt in their lifetime and between 8-10% of individuals with BPD eventually take their own life (Stone, 1990; Paris & Zweig-Frank, 2001; Paris, 2014; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Leichsenring, Leibing, Kruse, New, & Leweke, 2011; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2005, Linehan et al., 2006). This suicide rate ranges from 50-400 times the rate of suicide in the general population. Thus, self-injurious behaviors pose the greatest immediate health risk to borderline patients (Levy, 2005; Paris & Zweig-Frank, 2001).

Complicating matters, BPD frequently co-occurs with other disorders. In fact, an upwards of 85% of borderline patients meet criteria for both Axis I and/or Axis II disorders in tandem with BPD (Lenzenweger et al., 2007; Nurnberg et al., 1991; Zimmerman & Coryell, 1990; Fyer, Frances, Sullivan, Hurt, & Clarkin, 1988, Zanarini et al., 1998). The most common comorbidities include major depressive disorder (MDD), bipolar disorder, anxiety disorders, eating disorders, posttraumatic stress disorder (PTSD), and substance abuse (Clarkin, 2006; Zanarini et al., 1999; Zimmerman et al., 2010). Zanarini and colleagues (1999) highlight that BPD is commonly comorbid in a complex and uncommon way with various internalizing and externalizing disorders as well. Unfortunately, when comorbid with these disorders, BPD negatively affects the outcome of otherwise effective treatments for these disorders.

Given the high prevalence, common comorbidity with other disorders, and consequences of the diagnosis, it is vital that clinicians are able to quickly detect BPD. However, research shows that clinicians generally lack the ability to accurately identify the presence of borderline traits. In a study of 500 outpatients comparing diagnoses made by clinicians using ordinary

assessments and structured interviews, it was found that clinicians missed 97% of the cases of BPD. This disorder is regularly misdiagnosed as a mood disorder, with clinicians mistaking it's wavering impulsive, temperamentally explosive, and depressive characteristics for the manic and depressive episodes of bipolar disorder (Zimmerman & Morgan, 2013a; Zimmerman & Morgan, 2013b; Zimmerman, Martinez, Morgan, Young, Chelminski, & Dalrymple, 2013). The fast-pace affective shifts seen in borderline patients differ quite considerably from the more lengthy mood episodes characteristic of bipolar spectrum disorders. Yet, it is still over diagnosed amongst the BPD population (Ruggero, Zimmerman, Chelminski, & Young, 2010). Given these findings, it is not surprising that there is, on average, a six-year detection lag accompanied by a 74% misdiagnosis rate. The most common false-positive diagnoses include bipolar disorder (17%), depression (13%) and anxiety disorders (10%) (Magnavita et al., 2010).

Careful assessment by a well-trained mental health professional is crucial to delineate MDD, bipolar, and PTSD symptomatology from that of BPD in order to establish these disorders as true comorbidities or as differential diagnoses. The use of structured clinical interviews improved the identification of BPD; still, diagnostic measures are often time consuming, costly, and require extensive training. Screening instruments may help clinicians determine if a full structured interview is necessary for diagnosis. A number of clinical researchers have developed brief screening measures to identify individuals who may be suffering from BPD (Hyler et al., 1988; Morey, 1991; Loranger, 1994; Mann et al., 1999; Zanarini et al., 2003). Research has additionally found that using a two-stage screening process to identify those with a specific disorder is a useful strategy in research using such instruments (Lenzenweger, 1997; Korzekwa, 2008).

In an effort to address these diagnostic limitations and increase the success rate of BPD identification, Zanarini et al. (2003) developed the McLean Screening Instrument for Borderline

Personality Disorder (MSI-BPD). The measure comprises of 10 true/false self-report items that assess borderline criteria according to the Diagnostic Interview for the DSM-IV (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996) personality disorder module. The screener questions may be asked in person or via telephone and requires minimal training to administer. This makes it much less costly than full clinic assessments, while still being able to accurately predict cases of BPD in the early stages of treatment. In a sample of 200 women (n=139 borderline, 69.5%), the MSI-BPD demonstrated high sensitivity (0.81) and specificity (0.85) rates at an optimal cutoff score of 7 on the screener (Zanarini et al., 2003). More simply phrased, it was able to correctly identify men and women who met diagnostic criteria for BPD, as well as filter through those who did not meet the criteria.

Based on these findings, the MSI-BPD is a conceivably feasible tool for identifying individuals who should progress onto more thorough evaluations for borderline personality disorder (Zanarini et al., 2003; Klonsky, & Olino, 2008; Channen et al 2003). However, one study examining BPD in an outpatient headache sample found that the MSI-BPD had a weak capacity for identifying BPD in that sample (Rothrock, Lopez, Zweilfer, Andress- Rothrock, Drinkard, & Walters, 2007). Thus, replication is a necessary component of the research process to confirm the reliability and validity of this measure.

In the present study, we examine the predictive validity of the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD) for identifying individuals with BPD based on structured interviews using the conditional probabilities of positive predictive power (PPP), negative predictive power (NPP), sensitivity (SEN), and specificity (SPE). Definitions for the conditional probabilities can be seen in *Table 1*. In addition, we statistically assess the association between the two measures at different cut-offs using the Kappa statistic.

To address this research aim, the first hypothesis is that the MSI-BPD will have precision in predicting that participants who screen positive for borderline personality disorder will also have an actual diagnosis of BPD according to IPDE results. Conversely, the second hypothesis is that the MSI-BPD will predict that participants who do not meet clinical thresholds for BPD on the MSI-BPD will not have an IPDE diagnosis of the disorder either.

Chapter 2

Method

Participants

Participants were 239 (233 women) individuals who completed the MSI-BPD and the International Personality Disorder Examination (IPDE; Loranger, 1999) in an assessment designed to identify participants who are eligible for studies in the future. Age ranged between 18 and 60 years old (*M*= 27.46, *SD*= 10.10), with 131 (54.8%) individuals being below the age of 25 and 108 (45.2%) being 25 and older. Eighty-five percent of the participants identified as White, 9% as Black or African American, 5% as Asian, 1% as Pacific Islander/Hawaiian Native, and 0.5% as Native American/Alaskan Native.

Of the 239 individuals, 63 (26.4%) participants met criteria for a definite diagnosis of borderline personality disorder according to the IPDE and 7 participants were subthreshold. The remaining 169 participants did not meet criteria for BPD. To be eligible for the study participants had to be at least 18 years of age. Additionally, individuals with a history of schizophrenia, schizoaffective disorder, bipolar I disorder, delusional disorder, or other cognitive disorders were excluded from the study. Current diagnoses of major depressive disorder with neurovegatitive symptoms, panic disorder, post-traumatic stress disorder, or currently active substance dependence also compromised one's ability to participate.

Procedure

All measures and procedures used in the study received approval from the Pennsylvania State University Institutional Review Board. Participants were recruited through three main ways. Healthy control participants were evaluated using the MSI-BPD during a mass screening of undergraduate students taking Introduction to Psychology at a large Pennsylvania university.

Participants voluntarily completed the MSI-BPD as part of a large battery measures administered for through a mass screening of individuals participating for credit toward a research experience option in their introductory psychology course. A subset of individuals were contacted and invited to come to the lab to complete face-to-face clinical interviews, including the IPDE. Additionally, participants were recruited from a university psychology department based community mental health center. Flyers were posted within the clinic waiting rooms and intake clinicians were asked to provide clients with a brief description of various clinical studies underway. Interested clients either provided contact information that was relayed to the researchers or were given information so that they could contact the researchers directly.

Individuals who met the inclusion and exclusion criteria were contacted via telephone to confirm their interest to participate in the study. Potential clinical participants who met eligibility were asked the 10-true/false MSI-BPD questions and scheduled for the second portion of the investigation, which included the administration of the IPDE. MSI-BPD data were scored and scaled into a range of 0 to 1 for analysis. The study was kept double blind, as both participants and clinical interviewers were unaware of the individual's condition.

Research assistants guided all participants through the informed consent process at the beginning of the clinical interviews. Trained graduate-level students interviewed participants using a host of assessments, one of which being the IPDE. Following the conclusion of the interviews, individuals were debriefed and compensated for their time. Participants who came from the clinic received monetary compensation, while those recruited from the subject pool earned course credit.

Results from the IPDE were scored and entered into SPSS. Participants received a diagnosis of borderline personality disorder only if they earned a "definite" score of 2 (scoring

scale of 0-2), using the IPDE BPD subscale. Data from both measures were compared using cross tabulations and diagnostic agreement was assessed using Kappa coefficients.

Measures

The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003) targets the nine DSM-IV criteria specific to BPD. The self-report screening measure consists of 10 true/false questions. Each endorsed dichotomous item is worth 1 point on a 0 to 10 rating scale, thus participants selecting "True" for six of the items reach an MSI-BPD threshold of six and so on. The screener is found to have acceptable internal consistency (K= 0.74; Zanarini et al., 2003; Gardner & Qualter, 2009), and has demonstrated excellent sensitivity and specificity, with both values above 90% when comparing outcomes to structured clinical interviews for personality disorders (Zanarini et al., 2003). We adapted the screener for the current study in order to increase the ease of use over the telephone.

The International Personality Disorder Examination (IPDE; Loranger, 1999) is a semi-structured clinical interview used to diagnose all DSM-IV personality disorders, although only results from the 9-item BPD subscale are used for analysis in the study. For each of the 99 IPDE items, symptoms severity scoring ranges from 0 (absence or within normal range) to 2 (meets criteria as a pathological trait). This clinical measure has high inter-rater reliability (k= 0.71-1.0) for PDs generally, and has particularly strong diagnostic reliability for BPD specifically (k= 0.88) (Scott, Levy, & Granger, 2013). The IPDE has exceptionally high correlations across classes for number of BPD criteria met (0.94) and for BPD dimensional scores (0.98) (Scott, Levy, & Granger, 2013). Outcomes on the IPDE determined the official absence or presence borderline personality disorder for each participant.

Statistical Analysis

We evaluated the predictive validity of the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD, Zanarini et al., 2003) for detecting BPD as assessed with the IPDE. We examined predictive validity using four indices: positive predictive power (PPP), negative predictive power (NPP), specificity (SPE), and sensitivity (SEN). Positive predictive value is the probability that participants who meet thresholds on the screening test truly have a clinically significant diagnosis of BPD as indicated by a positive diagnosis on the IPDE. Negative predictive value is the probability that participants who screen negative do not have the disorder. Having high specificity suggests that a measure is capable of identifying symptoms indicative of borderline personality disorder, not those of other disorders. On the other hand, sensitivity is the probability that the measure will detect pathological symptoms at all. Cross tabulations were used to compute these validity indices at each of the MSI-BPD diagnostic threshold examined (5 through 8) using IBM SPSS 20 statistical software.

Additionally, Cohen's kappa statistic was used to evaluate the robustness of the agreement between measures. The kappa statistic, also referred to as the kappa coefficient, is the most frequently used method of analyzing inter-observer agreement. However, for the purposes of this investigation, the MSI-BPD and IPDE both act as the "observers". The results on each of the measures are representative of clinical observations, thus the kappa is used to determine how well their results agree. A kappa of 1.0 would indicate perfect agreement, and conversely, a kappa of 0.0 demonstrates agreement equal to chance (Viera & Garnett, 2005). Generally, 0.40 to 0.59 is considered fair agreement, with 0.60-0.74 considered good agreement, and greater than 0.74 considered excellent agreement (Fleiss, 1981)

Chapter 3

Results

Inter-measure Agreement

Diagnostic comparisons were made using participant results on the MSI-BPD and the IPDE. As shown in *Table 2*, the kappa value for an MSI-BPD threshold of 5 (k=0.42), 6 (k=0.43), and 7 (k=0.46) indicated moderate or fair levels of agreement (Fleiss, 1981). Yet, an MSI-BPD threshold of 8 fell into the poor to fair agreement range (k=0.38).

Specificity and Sensitivity

As previously mentioned, we assessed the predictive validity of the MSI-BPD using four validity indices: positive predictive power (PPP), negative predictive power (NPP), specificity (SPE), and sensitivity (SEN). The MSI-BPD demonstrated excellent sensitivity with cut-off scores of 5 or 6 (SEN= 0.84 and 0.81, respectively) and weaker sensitivity with cut-off scores of 7 or 8 (SEN= 0.68 and 0.54, respectively), displayed in *Table 2*. In contrast, its specificity increased with each additional criteria endorsed, starting from 68% at a threshold of 6 and elevating to 84% at a threshold of 8.

Positive and Negative Predictive Power

The positive predictive value was around 50% and ranged from 0.48 (cutoff of 5) to 0.56 (cut-off of 7) for the study population. Negative predictive power, on the other hand, was high for all cut-offs (NPP = 0.84-0.92), particularly for 5 (NPP= 0.92) and 6 (NPP= 0.91) criteria endorsed.

Age as a Moderator of Predictive Validity

Age of the participant slightly moderated the screener's predictive validity insomuch that the MSI-BPD was found to more soundly identify BPD in individuals younger than 25. The

kappa coefficient across all MSI-BPD thresholds rose within the moderate to fair agreement range for participants in this age cohort (k=0.45, 0.46, 0.48, and 0.45, respectively; see *Table 2*.). Meanwhile, *Table 4.* shows that the kappa coefficients for thresholds 5 (k=38), 6 (k=39), and 8 (k=31) fell into the fair to poor agreement range for participants aged 25 years and older. A threshold of 7 did reach the moderate to fair range (k=0.43), however.

Tables 3 and *4* describe a rise in specificity that parallels an increase in MSI-BPD thresholds from 5 through 8 for individuals under 25 (SPE= 0.71, 0.74, 0.84, and 0.86, respectively) as well as for those 25 and older (SPE= 0.63, 0.67, 0.76, and 0.81, respectively). Of course, these statistics demonstrate higher specificity for younger participants over all.

Likewise, sensitivity for both age clusters mimicked the pattern of the whole study population. It decreased with every increase in MSI-BPD threshold. Highest sensitivity scores were found at an MSI-BPD threshold of 5 (SEN= 0.87), and were lowest at a cutoff of 8 (SEN= 0.60) for young adults. Meanwhile, sensitivity was still greatest at 5 (SEN= 0.82) and lowest at 8 (SEN= 0.49) for the individuals 25 and over. Thus, sensitivity for participants under 25 exceeded the values of the older group across all screener cut-offs.

The screener has slightly lower positive predictive power for participants under 25 at cutoffs of 5 (PPP= 0.47 vs. 0.49) and 6 (PPP= 0.49 vs. 0.51), and higher at cutoff 8 (PPP= 0.56 vs. 0.53). Positive predictive value at a threshold of 7 was consistent at 56% for both groups. The MSI-BPD had consistently higher negative predictive values for participants under the age of 25, ranging from 95% (cutoff of 5) to 88% (cutoff of 8), and lower NPP for the older age group with values ranging of 88% at threshold 5 to 78% at threshold 8.

Chapter 4

Discussion

The purpose of this study was to assess the predictive validity of the Mclean Screening Instrument for Borderline Personality Disorder (MSI-BPD, Zanarini et al., 2003). Previous research suggests that the MSI-BPD can be an effective screening tool for identifying those who are likely to have BPD (Zanarini et al., 2003; Klonsky, & Olino, 2008; Channen et al., 2008), Nonetheless, one study found that the MSI-BPD had difficulty in identifying BPD among those presenting to a headache clinic (Rothrock, Lopez, Zweilfer, Andress- Rothrock, Drinkard, & Walters, 2007).

We evaluated the MSI-BPD at thresholds of 5, 6, 7, and 8 for their capacity to distinguish borderline subjects from those without the disorder using the aforementioned validity indices. Our findings are generally consistent with the initial validation study (Zanarini et al., 2003) for which a cutoff of 7 was recommended. Using this threshold, Zanarini and colleagues (2003) found the MSI-BPD had high sensitivity and specificity at 0.81 and 0.85, respectively. These statistics indicate that the screener is diagnostically efficient, achieving values on par with those found for screening tools for MDD (Zimmerman, Coryell, Corenthal, & Wilson, 1986) and bipolar spectrum disorders (Hirschfeld et al., 2000). However, we did not obtain as high of values for the validity indices, achieving scores of 0.68 (sensitivity) and 0.81 (specificity). At 6 criteria endorsed, Zanarini et al. (2003) found that sensitivity rose slightly to 0.89, but specificity dropped to 0.66. In our study, sensitivity increased to 0.81 and specificity decreased to 0.71 at this threshold.

Based on previous research, we first hypothesized that the MSI-BPD would accurately predict a borderline diagnosis insomuch that those with positive results on the screener would tend to have BPD as assessed by the IPDE. We tested this hypothesis by evaluating the MSI-

BPD's positive predictive power and sensitivity. Results reveal that the MSI-BPD has moderate positive predictive power (48-56%), and that this is generally consistent regardless of age. PPP elevated for both age groups with each additional criterion endorsed. However, *Table 2* shows that the screener did have slightly lower PPP for participants under the age of 25 at cutoffs of 5 and 6, but equal or greater PPP at thresholds of 7 and 8 relative to older participants.

Perhaps positive predictive power is lower at cutoffs of 5 and 6 for young adults because they might more inclined to act on the whim of their emotions. Participants under 25 may be more likely to endorse criteria, such as impulsivity, without actually having BPD therefore leading to a false positive result at lower thresholds on the MSI-BPD. A higher cutoff would better distinguish between normative emotional behaviors from those of clinically significant symptoms of borderline personality disorder in this case. For older adults, higher positive predictive values at lower thresholds may indicate that, generally speaking, older adults experience better mood stability. In this sense, a lower threshold would perhaps better detect BPD in those 25 and over relative to younger individuals.

There are age differences in sensitivity of the MSI-BPD as well, having better sensitivity for younger adults except for at a cutoff of 7. Again, individuals under 25 in the general population tend to act impulsively or to have chaotic relationships, for instance, simply because of their youth and point in personal development. Thus, young people without BPD might over-report the severity, frequency, and/or level of impairment in daily functioning. Of course, clinical symptom intensity is often at its peak in early adulthood as well. The MSI-BPD is less sensitive at 7 (SEN= 68) criteria endorsed compared to 5 (SEN=0.87) and 6 (SEN= 0.68), but it has the most validity (k= 0.48) compared to other thresholds therefore seeming to have greater success in accurately detecting cases of BPD.

The data also supported our second hypothesis by demonstrating that participants who do not have BPD according to the MSI-BPD would typically not have an IPDE diagnosis of the disorder either. This was tested using the remaining two validity indices of negative predictive power and specificity. The greatest NPP for the sample has a whole hovered around 92% at a threshold of 5 and steadily decreased with each criterion endorsed. Following the trend of the other results, the MSI-BPD demonstrated variance in NPP values between age groups. Negative predictive value was higher for younger adults (95%) at a cutoff of 5 than older adults (89%), and showed a smaller decrease in NPP across thresholds, as seen in *Tables 3* and *4*. In essence, the MSI-BPD has demonstrated an excellent capacity to filter out individuals who do not meet criteria for BPD from those who experience clinically significant symptoms.

Results furthermore confirm the second hypothesis as the MSI-BPD showed high specificity. It was able to determine that the adults who acquired positive results on the screener met criteria that are specific to BPD, and were not indicative of another psychopathologies. Overall specificity of the MSI-BPD was highest at 8 criteria endorsed (SPE= 0.84), but using such a high threshold limits its use to only detecting the most severe cases, thus restricting its capacity to predict BPD. This is simply not practical. Specificity still remained high at lower cutoffs, but appeared to be particularly strong at 7 (SPE= 0.81). The screener was, again, better able to specify a diagnosis of BPD for younger adults (SPE= 0.84) relative to older adults (SPE= 0.76) at this threshold albeit both values remain within the high range (Fleiss, 1981).

Taken all together, results replicate the earlier findings that the MSI-BPD is more effective with younger participants (< 25yrs.; Zanarini et al., 2003) A smaller and higher range of kappa coefficients for participants under 25 (k= 0.45-0.48) compared to those 25 and older (k=0.31-0.43) suggests there is generally more agreement between measures for younger individuals irrespective of the criteria threshold.

What might account for the disparity in predictive validity of the MSI-BPD amongst older and younger adults? A recent study describes that there are a number of significant age-related differences in the clinical presentation of borderline personality disorder (Morgan, Chelminski, Young, Dalrymple, & Zimmerman, 2013). Using a large sample of adults enrolled in psychiatric outpatient services, Morgan and colleagues (2013) found that participants aged 18 to 25 (n= 97) had an increased likelihood of endorsing the BPD criterion of impulsivity, affect instability, and engagement in self-harm behaviors. Younger adults were also more likely to have co-morbid substance use disorders, although comorbidities in general were equally prevalent across ages. Functional impairment across multiple settings was also consistent for all ages. Social impairment however was more common in older individuals aged 45 to 68 (n= 46) and they reported higher rates of chronic emptiness and hospitalizations over the life course (Morgan et al., 2013). Thus, BPD appears to differ in terms of symptom presentation as a function of age.

Given these age related differences in symptomatology, it may be useful to develop age-based versions of the MSI-BPD: one for individuals under 25 and another for those who are 25 and older. Since BPD presents itself in unique ways throughout developmental periods (Morgan et al., 2013), an age specialized screener may help to increase its predictive validity further. This would aid with early risk detection for young adults displaying early signs of the disorder. Along these lines, there has been an increasing body of work in the area of BPD detection and intervention for adolescents (Chanen, 2011; Kaess, Brunner, & Chanen, 2014; Fossati, 2015; Sharp, & Fonagy, 2015; Kongerslev, Chanen, & Simonsen, 2015). Yes, personality disorders have a later onset, typically appearing in the late teens and early twenties (Paris, 2013; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004), but the screener could possibly assess a younger individual on the presence of early risk factors for BPD. Conduct disorder, for example is a known common predecessor of antisocial personality disorder (Langbehn, Cadoret, Yates,

Troughton, & Stewart, 1998). Such might be the case for borderline patients, although behavioral antecedents and intervention methods may differ in the case of BPD diagnoses. Therefore it may be extremely beneficial to create a screening tool adapted for use in children and adolescents.

Nonetheless, until such screeners are developed, we recommend tailoring the use of the current MSI-BPD. More specifically, we recommend a cut-off score of 6 be used as part of a two-stage process to identify those likely to have BPD in a similar fashion as the present study. This threshold is slightly more lenient than a cutoff of 7, but still maintains good predictive validity (k= 0.43) to help capture cases of BPD, especially in older adults. While more stringent, requiring individuals to endorsed 7 items of the MSI-BPD has advantages as well and has the greatest predictive validity (k= 0.46) of all MSI-BPD thresholds examined. When caseness is particularly important, a cut-off of seven may be preferred.

Our findings are optimistic for patients and psychologists alike. Most psychopathologies differ in regards to their course of development, and therefore the targeted mechanisms of change for each disorder varies quite considerably. Early and accurate diagnosis of BPD allows a therapist to swiftly choose the most effective forms of treatment that will best address these underlying mechanisms of the disorder. This may help to expedite the therapeutic process for his or her client and by maximizing the efficacy of therapy as well as improve the client's therapeutic experience. Should comorbidities exist, a BPD diagnosis still takes treatment precedence as it inhibits the effectiveness therapies for most other disorders.

Although investigators took precaution in designing this study, it does have limitations. In the initial validation study by Zanarini and colleagues (2003) used different clinical measures as a diagnostic comparison, such as the Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV; Zanarini et al., 1996) as apposed to the IPDE. This may not necessarily be a

limitation, however, given that the MSI-BPD still managed to effectively detect BPD and demonstrates its robustness across various diagnostic clinical measures. Furthermore, we would like to highlight that the MSI-BPD is not to be used alone, but rather as a screening tool to identify individuals who might benefit from further psychological assessments for borderline personality disorder.

Strengths of the current study include a mixed population of clinical and non-clinical participants as well as the use of the IPDE, generally considered to be a conservative measurement to assess for BPD than the DIPD-IV utilized by Zanarini et al (2003). However, results may be distorted as clinical participants were referred to our study based on difficulties associated with BPD.

Chapter 5

Conclusion

In essence, the MSI-BPD appears to be a dependable and practical screening tool for identifying those who might benefit from an in-depth structured clinical interview for borderline personality disorder. We would suggest that the cut-off score employed should be tailored to the intended use. A cut-off score of 6 is appropriate when seeking to identify BPD patients through a two-stage process, but a threshold of 7 when establishing caseness is particularly important Slight differences in outcome values for SEN, SPE, PPP, and NPP relative to the Zanarini et al. (2003) might be attributed to small differences in study characteristics. These results may have particularly important implications for clinical populations diagnosed with treatment resistant depression, bipolar disorder, and anxiety disorder disorders where the identification of BPD is especially imperative.

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APPENDIX A: TABLES

Table 1. Definitions of the four predictive validity indices.

Conditional Probabilities	Definition
PPP	The conditional probability of receiving a probable diagnosis of a PD on the interview given that there was a positive diagnosis of a PD on the screener.
NPP	The conditional probability of not receiving a PD diagnosis on the interview given that there was a negative diagnosis of a PD on the screener
Sensitivity	The probability that, given the presence of a positive diagnosis of a PD on the interview, the threshold was met for a probable PD on the screener.
Specificity	The probability that, given an absence of BPD on the interview, the threshold for a PD was not met on the screener.

Table 2: Predictive Validity of the MSI-BPD at different thresholds (N =239)

	MSI-BPD Threshold			
	5	6	7	8
PPP	0.48	0.50	0.56	0.55
NPP	0.92	0.91	0.88	0.84
Sensitivity	0.84	0.81	0.68	0.54
Specificity	0.68	0.71	0.81	0.84
Kappa	0.42	0.43	0.46	0.38

Table 3. Predictive Validity of the MSI-BPD at different thresholds for participants under 25 (n=131)

	MSI-BPD Threshold			
	5	6	7	8
PPP	0.47	0.49	0.56	0.56
NPP	0.95	0.94	0.90	0.88
Sensitivity	0.87	0.83	0.68	0.60
Specificity	0.71	0.74	0.84	0.86
Kappa	0.45	0.46	0.48	0.45

Table 4. Predictive Validity of the MSI-BPD at different thresholds for participants 25 and over (n=108)

	MSI-BPD Threshold			
	5	6	7	8
PPP	0.49	0.51	0.56	0.53
NPP	0.89	0.88	0.85	0.78
Sensitivity	0.82	0.79	0.70	0.49
Specificity	0.63	0.67	0.76	0.81
Kappa	0.38	0.39	0.43	0.31

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Teaching and Leadership Experience

2015 - Present **DreamTeen Non-Profit Executive Board Member**
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Summer 2013 **Literature and Visual Arts: Representing the Irish Landscape**
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