
ARTICLES

Correlates of the MMPI–A Psychopathology Five (PSY–5) Facet Scales in an Adolescent Inpatient Sample

JOHN STOKES,^{1,2} DAVID POGGE,² JESSICA SARNICOLA,¹ AND ROBERT MCGRATH³

¹*Department of Psychology, Pace University*

²*Four Winds Hospital, Katonah, New York*

³*Department of Psychology, Fairleigh Dickinson University*

We explored the validity of the Psychopathology Five (PSY–5) facet scales of the adolescent version of the Minnesota Multiphasic Personality Inventory (MMPI–A; Butcher et al., 1992) in an adolescent inpatient psychiatric sample ($N = 662$) through a series of correlational analyses with self-report measures, therapist ratings, and chart review variables. Consistent with previous research with PSY–5 parent scales, externalizing symptoms were most clearly related to Hostility and Delinquent attitudes facet scales; internalizing symptoms were most clearly related to the presence of high Neuroticism facet scales and Low Drive/Expectations facet scales; and bizarre features and psychotic symptoms were most strongly related to both the Psychotic Experiences and Odd Mentations facet scales as well as the Low Drive/Expectations facet scales. These findings lend some support for the use of these facet scales as useful adjuncts to the PSY–5 parent scales.

The exploration of the Personality Psychopathology Five (PSY–5) scales of the adolescent version of the Minnesota Multiphasic Personality Inventory (MMPI–A; Butcher et al., 1992) is important for both conceptual and clinical reasons. Theoretically, the use of these scales dovetails with increased interest in the dimensional conceptualization of personality disorders (Clark, McEwen, Collard, & Hickok, 1993; Harkness, 1992; Harkness & McNulty, 1994; Huprich & Bornstein, 2007; Livesly, Jackson, & Schroeder, 1991; Weston & Shedler, 1999; Widiger & Simonsen, 2005) and provides a descriptive, dimensional model of personality that complements categorical personality disorder diagnosis (McNulty, Harkness, Ben-Porath, & Williams, 1997). At least two of the PSY–5 scales can be related to Five-factor model (FFM) constructs (Costa & McCrae, 1992a). For instance, Trull, Useda, Costa, and McCrae (1995), working with an adult population, found large correlations between PSY–5 Positive Emotionality and FFM Extraversion scores ($r = .71$) as well as between PSY–5 Negative Emotionality and FFM Negative Emotions facet scores ($r = .67$), with medium to large correlations between the PSY–5 model and all facet scores within the respective dimensions of the Revised NEO Personality Inventory (NEO–PI–R; Costa & McCrae, 1992b). The relationship between the remainder of the PSY–5 scales (Psychoticism, Disconstraint, and Aggressiveness) and the remaining FFM factors is less clear and suggests that the MMPI–A PSY–5 model adds alternative dimensions for conceptualization of personality functioning. Such a difference is to be anticipated given that this model purposely includes some maladaptive personality characteristics that are not adequately represented by the FFM constructs (Harkness & McNulty, 1994). The PSY–5

dimensions may offer advantages over FFM dimensions in understanding personality psychopathology in clinical populations because they not only may reflect the presence of characteristics that are rarely encountered in normal populations but may have a higher “ceiling” for maladaptive levels of such characteristics (Bolinskey, Arnau, Archer, & Handel, 2004).

One major concern about diagnosis of personality disorders prior to adulthood stems from findings indicating that personality traits have been found to be less stable during childhood and adolescence than during adulthood (Roberts & DelVecchio, 2000), with maladaptive personality traits declining over time (Korenblum, Marton, Golombek, & Stein, 1987; B. Stein, Golombek, Marton, & Korenblum, 1987). However, an exploration of personality dimensions is crucial in light of accruing evidence that adolescent personality traits may be more stable than previously believed (e.g., Westen & Chang, 2000). Johnson et al. (2000) found that overall levels of personality disorder traits generally showed a statistically significant (28%) linear decline between the ages of 13 and adulthood. Personality disorder traits were moderately stable over a 2-year interval in early to middle adolescence, and demonstrated low to moderate stability over a 6-year interval between early to mid adolescence and adulthood. Despite the decline in personality disorder trait levels, adolescents diagnosed with personality disorders continued to have elevated trait levels in early adulthood. These findings are similar to those of Chanan et al. (2004) who found that the 2-year stability of the global category of personality disorders in older (15- to 18-year-old) adolescents was high, with the stability of dimensions related to personality disorders comparable to that found in young adults, particularly for cluster A and B personality disorders.

The development of the PSY–5 scales for the MMPI–A also adds an additional dimension to clinical interpretation that requires exploration. First, although these traits are present in

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Address correspondence to John M. Stokes, Department of Psychology, Pace University, 41 Park Row, New York, NY 10038; Email: jstokes@pace.edu

adolescents (John, Caspi, Robins, Moffit, & Stouthamer-Loeber, 1994), show moderate continuity over time (Caspi & Roberts, 2001), and show relationships with problematic behaviors and symptoms (McNulty et al., 1997), there are few studies examining the predictive validity of the PSY-5 model in adolescents that extend to the facet scales. Second, the addition of these rationally derived personality dimensions to the MMPI-A offers the possibility of addressing some of the problems with interpretation in clinical practice that have arisen due to unusually high numbers of within-normal-limits profiles in clinical populations with the use of either the Clinical scales or the MMPI-A structural summary factors (Archer, 1987/2005; Pogge, Stokes, McGrath, Bilginer & DeLuca, 2002). The addition of the PSY-5 Scales and facet scales may enable clinicians to augment MMPI-A interpretation to include identification of maladaptive personality characteristics that may not reach levels needed for *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [DSM-IV]; American Psychiatric Association, 1994) Axis I or Axis II diagnoses but that may be important in treatment and intervention planning. In addition to adding a dimensional perspective, profile analyses of PSY-5 scales and facet scales may enable identification of subsets of personality configurations that are associated with increased risk for the development of other disorders. Finally, the facet scales also expand clinical interpretation to include dimensions of personality that may provide additional insights into trait-related causes of problematic or symptomatic behavior.

Previous research with adult populations has indicated that the PSY-5 scales offer greater information beyond the use of the Clinical and Content scales of the MMPI-2, which tend to focus on a combination of trait-like characteristics and transitory symptoms of psychological distress. PSY-5 scales, by contrast, offer information about personality structure and traits that may be more pervasive and important to consider in case conceptualization and treatment planning (Wygant, Sellbom, Graham, & Schenk, 2006). The limited body of research to date has been primarily correlational, with focus on comparison of the PSY-5 scales with other self-report measures. However, McNulty et al. (1997) also proposed that the PSY-5 scales hold utility in clinical practice because of their construct connection with structural models of personality including the Five-factor model. Traits associated with the Five-factor model, such as those utilized in the PSY-5 scales, have exhibited continuity across development from childhood through adulthood and have been explored in relation to both personality disorders (e.g., Lynam & Widiger, 2001; Warner et al., 2004; Widiger, Trull, Clarkin, Sanderson, & Costa, 1994) and Axis I disorders (e.g., Malouff, Thorsteinsson, & Schutte, 2005; Trull & Sher, 1994). Research in a school population showed moderate stability of five-factor traits over a crucial developmental period of 4 years between late childhood and early adolescence (Digman, 1989). Ben-Porath, Graham, Archer, Tellegen and Kaemmer (2006) pointed out that the 1 year, test-retest correlations for higher order PSY-5 scales obtained by L. A. R. Stein, McClinton, and Graham (1998) were consistent with trait consistency population estimates reported by Roberts and DelVecchio's (2000) meta-analysis for adolescents. These traits are also adaptable to the understanding of behaviors in other nonclinical settings. The way in which teachers and school counselors describe individuals frequently corresponds to dimensions on the Five-factor model. Traits are also associated with attributes that are readily apparent in school

settings. For example, Conscientiousness has been shown to correlate highly with academic competence and Extraversion with social competence (Graziano & Ward, 1992).

The PSY-5 factor scales were originally developed by Harkness and McNulty (1994) to measure personality traits relevant to both normal and abnormal personality functioning on the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). Harkness and McNulty then determined that the MMPI-A also contained sufficient item content to assess these same constructs and developed the PSY-5 model for use with the adolescent version (McNulty et al., 1997). To develop the MMPI-A PSY-5 facet scales, McNulty et al. added 25 additional rationally derived items from the MMPI-A to the 104 items that were shared by both the adult and adolescent versions of the MMPI. These scales are based on the assumptions of the Five-factor model of personality functioning in which traits are assumed to be dimensional in nature and stable across time and situations. McNulty et al. (1997) found that the MMPI-A PSY-5 scales related in meaningful and predictable ways to other MMPI-A Clinical and Content scales. McNulty et al. also found that the PSY-5 scales were correlated with a record review form designed to obtain information about problem behaviors, sexual or physical abuse, drug use, and juvenile court involvement. The MMPI-A PSY-5 scales also demonstrated generally low to medium relationships with parent ratings of problematic behavior across different rating scales.

After the initial development of the MMPI-A PSY-5 scales, Bolinsky et al. (2004) explored the PSY-5 scales in a sample of 545 adolescents receiving inpatient psychiatric treatment. This research replicated a pattern of meaningful correlations with other MMPI-A Clinical and Content scales. Additionally, Bolinsky et al. developed facet scales that appear to be consistent with the original constructs offered by Harkness, McNulty, Ben-Porath and Graham (2002), with predominantly acceptable internal consistencies. Item-level principal components analysis (PCA) carried out on tetrachoric correlation matrices revealed that the PSY-5 Neuroticism/Negative Emotionality was essentially unidimensional and could not be subdivided into reliable facet scores. Each of the other factors was found to be comprised of two facets. In accordance with Harkness and McNulty's (1994) view of the PSY-5 Aggressiveness factor as being associated with both offensive aggression and grandiosity and desire for power, the PCA revealed two facets labeled *Hostility* and *Grandiosity/Indignation*. The Disconstraint factor (which is the reverse scoring of the original Constraint factor) was found to be comprised of Delinquent Behaviors and Attitudes and Norm Violation, a division consistent with previous definitions of the Disconstraint factor. The Psychoticism factor, which refers to reality contact, hypervigilance, unusual beliefs, and perceptual aberrations, was comprised of a Psychotic Beliefs/Experiences facet and an Odd Mentation facet. Finally, the Introversion factor (which is the reverse scoring of the previously named Positive Emotionality/Extraversion factor) was comprised of two facets that reflected Low Drive and Low Sociability.

Although the MMPI-A PSY-5 facet scales may offer the potential for greater predictive utility and more precise case conceptualization, there has been little research to date concerning the correlates of the MMPI-A PSY-5 facet scales. As a means of exploring their potential use with adolescent populations, in this research, we sought to identify how the PSY-5 facet

scales related to self-report, therapist ratings, chart diagnosis, structured interview for *DSM-IV* psychoactive substance use disorders, and chart review of symptomatic behaviors in an adolescent inpatient psychiatric sample. Consistent with previous research and theory (Durrett & Trull, 2005; Krueger, McGee, & Iacono, 2001; Lynam et al., 2005; McNulty et al., 1997; Miller, Lynam, & Leukefeld, 2003; Sharpe, 2001; Trull & Scher, 1994; Widiger & Trull, 1992), we predicted that the Negative Emotionality/Neuroticism facet scales would correlate most strongly with internalizing disorders and symptoms. Aggression and Disconstraint facet scales were expected to correlate most strongly with disruptive, aggressive, and psychotic behaviors, and Psychoticism and Low Positive Emotionality/Introversion facet scales were expected to correlate most strongly with psychotic manifestations.

METHOD

Participants

Data was gathered from a sample of 716 adolescent inpatients in a private psychiatric inpatient facility who had been referred for psychological assessment that routinely included the MMPI-A and other measures. These assessments were most frequently obtained within the first 2 weeks of admission. The sample was 69.4% White, 14.6% African American, 13.0% Hispanic/Latino, and 3% unknown or other ethnic groupings. Primary and secondary discharge diagnoses obtained from their medical records included psychotic disorders (14.2%), mood disorders (70.3%), disruptive behavior disorders (13.3%), and other disorders (36.6%). The sample functioned within the average range ($M = 97.26$, $SD = 16.41$) as measured by the Wide Range Achievement Test Reading subtest (Wilkinson, 1993), and participants were generally able to manage the seventh grade reading level required for the MMPI-A (Archer, 1987/2005). However, approximately 5% of the sample reported significant problems with reading comprehension of items and were administered the MMPI-A via audiotape. Only those adolescents who had valid MMPI-A profiles and who had completed all measures were selected. Validity criteria for the MMPI-A consisted of the following: Cannot Say raw score 25, Variable Response Inconsistency (VRIN) and True Response Inconsistency (TRIN) T score 80, and F scale T score 90. The application of the validity criteria resulted in the elimination of 54 participants. The final sample consisted of 662 adolescents (304 boys, 358 girls), ranging in age from 13 to 18 years ($M = 14.9$, $SD = 1.13$). A series of chi-square comparisons revealed high levels of concordance (with respect to age, gender, and discharge diagnosis) between this sample and a sample of patients ($N = 457$) who had not been referred for psychological evaluation. Thus, there is no reason to suspect that there is any selection bias related to referral for the psychological evaluation.

Instruments

Following previous research with the PSY-5 model (McNulty et al., 1997), we examined the relationships between the PSY-5 Facet subscales and three broad classes of symptomatic behavior: internalizing, externalizing, and bizarre features. In this study, we relied on a combination of self-report, therapist ratings, and information obtained from chart review.

Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994). The SCL-90-R is a 90-item rating scale used to assess symptoms experienced over the previous week. It is composed of nine scales and yields three overall indexes. To reduce the experiment-wise error rate, only those scales that related most clearly to the constructs of internalizing, externalizing, or bizarre features were examined. Subscales used in this study included Hostility Depression, Anxiety, Paranoid Ideation, and Psychoticism. Internal consistency (coefficient alpha) and test-retest reliability for these scales falls within the very good to excellent range (ranging from .77-.90; Derogatis, 1994; Derogatis, Lipman, & Covi, 1973).

Achenbach Youth Self-Report (YSR; Achenbach & Edelbrock, 1987). In this study, we used both broadband scales (Internalizing and Externalizing) and one syndrome scale (Thought Problems) from the YSR, which is one element of the Achenbach System of Empirically Based Assessment (Achenbach & Rescorla, 2001). Estimates of reliability fall within the good to excellent range.

Hopkins Psychiatric Rating Scale (HPRS; Derogatis, 1977). The HPRS is a therapist rating scale composed of 17 symptom items and a global psychopathology measure. The global pathology measure is rated on a 9-point scale ranging from 0 (*Absent*) to 8 (*Extreme*), whereas the individual symptom items are rated on a 7-point scale ranging from 0 (*Absent*) to 6 (*Extreme*). Interrater reliability of the HPRS in our setting has been determined to have an interrater correlation coefficient of .91 for the global score when comparing trained clinical raters and therapist raters (Bilginer, DeLuca, Pogge, Stokes, & Harvey, 2005). Each patient's therapist completed an HPRS within the 1st week of hospitalization, thus providing a quantitative summary of each patient's symptoms at the time of admission. The HPRS scales used in this study were those that corresponded to the SCL-90-R variables that were chosen and included Hostility, Depression, Anxiety, Psychotic Behaviors, Conceptual Dysfunction, and Disorientation.

Chart review. All charts were reviewed according to the record review format created by Williams and Butcher (1989). The admission note, psychiatric history, progress notes, and discharge summary for each chart were reviewed by trained graduate students in clinical psychology who judged each category as being "absent" or "present." A total of 20% of the charts were subjected to second review. Discharge diagnoses were recorded from the chart. These diagnoses were assigned to three categories: conduct disorder, depressive disorder (only major depressive disorder and dysthymic disorder were coded within this category) and psychotic disorder (only schizophrenia, brief psychotic disorder, psychotic disorder were coded within this category). The percentage of occurrence, percent agreement, and Kappa coefficients for each of the chart review variables is presented in Table 1. Only those variables with at least 75% interrater reliability were used in this study.

Psychoactive Substance Use Disorder (PSUD) module of the Structured Clinical Interview for the DSM-IV (SCID; Spitzer, Williams, & Gibbon, 1987). The PSUD module of the SCID was administered as part of the comprehensive evaluation. For this study, separate ratings were made with respect

TABLE 1.—Chart review variables: Rates of occurrence and interrater reliability.

Variable	Percentage Occurrence	Percentage Agreement	Kappa
Externalizing			
Conduct disorder diagnosis	6.0	n/a	n/a
Angry outbursts/tantrums	40.3	87	.69
Criminal behavior/trouble with law	31.0	80	.60
Oppositional behavior	60.6	79	.54
History of running away	24.7	93	.81
Violent behavior/fighting	60.9	91	.78
Sexually active	55.7	94	.88
Experimentation with alcohol	62.8	n/a	n/a
Experimentation with cannabis	64.2	n/a	n/a
Alcohol abuse or dependence	11.9	n/a	n/a
Cannabis abuse or dependence	20.9	n/a	n/a
Internalizing			
Diagnosis of MDD or dysthymia	35.9	n/a	n/a
Depressed mood	88.0	81	.66
Lethargy/fatigue	29.7	85	.60
Phobias	4.3	100	1.00
Poor social skills	38.8	84	.67
Suicidal ideation	60.0	95	.90
Suicide attempt	24.1	92	.79
Psychotic symptoms/bizarre			
Any psychotic disorder diagnosis	14.2	n/a	n/a
Bizarre behaviors	6.0	80	.66
Bizarre thoughts	10.8	94	.59
Hallucinations	23.7	97	.90
Paranoid ideation	40.3	92	.83

Note. n/a = not available; MDD = major depressive disorder.

to the presence of alcohol and cannabis experimentation and the presence of alcohol and cannabis abuse or dependence. The percentages of adolescents who either experimented with alcohol or cannabis dependence or met criteria for alcohol abuse or dependence or cannabis abuse or dependence are presented in Table 1. Because ratings were drawn from clinical interviews that were not recorded, it was not possible to obtain interrater reliabilities for these variables.

Design and Procedures

PSY-5 facet scales. PSY-5 raw facet scores were computed for each participant using the scoring key presented by Bolinsky et al. (2004). We calculated internal consistency coefficients (Chronbach's coefficient alpha) for each of the PSY-5 scales and facet scales. We evaluated the relationships between PSY-5 facet scales and each series of criterion measures through a series of exploratory correlational analyses. The correlational analyses between facet scales and self-report measures revealed a more undifferentiated pattern of relationships that was most likely attributable to a combination of response bias features and a degree of general distress that saturates the SCL-90 scales. To address these issues, we carried out multiple regression analyses for each self-report measure to determine the linear combination of traits most closely associated with each self-report measure.

TABLE 2.—Descriptive statistics, standardized alpha coefficients, and effect sizes for age and gender for the PSY-5 scales and facet scales raw scores.

Scale	No. of Items	Standardized α	<i>M</i>	<i>SD</i>	Effect Size (<i>r</i>)	
					Gender ^a	Age
Aggression	20	.79	8.94	4.37	-.03	-.10**
Hostility	14	.78	5.90	3.37	-.06	-.12**
Grandiosity/Indignation	6	.50	3.04	1.57	-.07	-.04
Disconstraint	24	.82	11.28	5.04	-.17**	.02
Delinquent Attitudes	16	.75	8.29	3.58	-.18**	.09*
Norm Violations	8	.65	2.93	2.02	-.04	-.10**
Introversive/Low Positive Emotionality	28	.82	8.01	5.08	.05	-.07
Low Drive/Expectations	14	.76	4.38	3.12	.04	-.11
Low Sociability	14	.74	3.63	2.87	-.15**	-.07
Psychoticism	18	.80	4.17	3.62	-.03	-.10**
Psychotic Beliefs/Experiences	13	.77	2.63	2.62	-.06	-.13**
Odd Mentation	5	.50	1.79	1.62	-.02	-.04
Neuroticism/Negative Emotionality	22	.81	11.28	4.78	.10*	-.02

Note. PSY-5 = Psychopathology Five.

^a Coded as Male = 1, Female = 2.

* $p < .05$. ** $p < .01$.

RESULTS

Descriptive statistics and internal consistency coefficients for the facet subscales are presented in Table 2. These compare favorably to those obtained previously for the higher order PSY-5 scales (Ben-Porath et al., 2006) and the facet scales (Bolinsky et al., 2004). The internal consistency coefficients for the higher order scales were very good to excellent (ranging from .78 to .83). Coefficients for the longer facet scales were generally in the good to excellent range, with predictably lower internal consistency for those scales with fewer items. The three scales with fewer than eight items predictably demonstrated lower internal consistency. Internal consistency of the Grandiosity/Indignation ($\alpha = .50$) and Odd Mentation ($\alpha = .50$) facet scales was somewhat lower than had been previously obtained, whereas the internal consistency estimate obtained for the Norm Violation facet scale was somewhat higher ($\alpha = .65$).

Correlational analyses revealed small relationships between age and gender and some of the higher order and facet scale raw scores. These relationships are summarized in Table 2. Male patients were slightly more likely to show elevations on the higher order Disconstraint facet than female patients, with the bulk of this difference emerging with respect to the Delinquent Attitudes facet scale. Girls were more likely to demonstrate higher elevations on the Neuroticism/Negative Emotionality facet scale. Younger patients were more likely to elevate on the facet scales of Hostility, Delinquent Attitudes, Norm Violations, and Psychotic Beliefs and Experiences. It should be noted that these effect sizes are small, and the pattern of intercorrelations among the facet scales for both boys and girls (presented in Table 3) indicates a highly similar pattern of relationships between the facet scales across genders.

To explore the relationship between the facet scores and criterion measures, we conducted correlational analyses. We utilized Pearson product-moment correlations for continuous variables derived from self-report (SCL-90, YSR) and therapist ratings (HPRS). Point-biserial correlations were used for criterion variables that were dichotomous (discharge diagnoses

TABLE 3.—MMPI-A PSY-5 facet scales: Correlation matrix by gender.

Scale	Hostility	Grandiosity	Delinquent	Norm Violation	Low Drive	Low Sociability	Psychotic Beliefs	Odd Mentation	Neuroticism
Hostility	—	.55**	.46**	.38**	.29**	-.03	.45**	.43**	.56**
Grandiosity	.47**	—	.28**	.25**	.04	-.11	.26**	.33**	.40**
Delinquent	.51**	.39**	—	.35**	.07	-.18*	.22**	.32**	.19**
Norm Violation	.35**	.06	.37**	—	.31**	.07	.36**	.29**	.17**
Low Drive	.40**	-.01	.11*	.34**	—	.55**	.47**	.37**	.41**
Low Sociability	-.02	-.15**	-.20**	-.02	.44**	—	.22**	.13*	.09
Psychotic Beliefs	.42**	.26**	.28**	.23**	.45**	.25**	—	.60**	.43**
Odd Mentation	.46**	.25**	.29**	.22**	.49**	.17**	.66**	—	.50**
Neuroticism	.56**	.26**	.15**	.17**	.49**	.06	.37**	.46**	—

Note. MMPI-A = adolescent version of the Minnesota Multiphasic Personality Inventory; PSY-5 = Psychopathology Five. Correlations for boys (N = 304) appear above the diagonal; correlations for girls (N = 358) appear below the diagonal.
 *p < .01. **p < .001.

of conduct disorder, depressive disorder, or psychotic disorder; chart review measures). To conserve space, these correlations are presented together. Regression analyses to determine which facet scales were most strongly predictive of self-reported symptoms are also presented.

Relationships with Externalizing Symptoms and Features

The relationships between the PSY-5 facet scales and externalizing symptoms and features are presented in Table 4. The pattern of relationships generally supports the hypothesis that externalizing symptoms are most closely related to those facet scales associated with Aggressiveness and Disconstraint. The facet scales were not related to the presence of a discharge diagnosis of conduct disorder, with the exception of the Hostility facet scale, which showed a small relationship. This may be partially attributable to the low frequency of conduct disorder diagnoses in this sample. To more fully determine the relationship between the PSY-5 facet scales and self-report measures, we conducted a series of regression analyses using the facet scales as the predictors. As demonstrated in Table 5, the YSR

Externalizing scale is predicted not only by the combination of Hostility and Delinquent Attitudes facet scales but also by the presence of lower scores on the Low Sociability facet scale and higher scores on the Neuroticism facet scale. It is important to note that even those adolescents with disruptive behaviors within this setting are likely to be experiencing high levels of distress and that this elevation may be partially attributable to this distress. However, relationships between Neuroticism and externalizing behaviors have also been observed in previous research. Miller et al. (2003) found significant relationships between the angry-hostility, depressive, and impulsiveness facets of the NEO-PI-R (Costa & McCrae, 1992b); Neuroticism facet scales; and a range of externalizing variables, including the stability of conduct problems, the variety of conduct problems, and the presence of aggressive behaviors. This combination of features is also similar to Westen and Chang's (2000) description of the "oppositional dysphoric personality style" (p. 87) and is not inconsistent with findings from adult samples that have found high levels of Negative Emotionality in aggressive psychopaths (Hicks, Markon, Patrick, Krueger, & Newman, 2004).

TABLE 4.—MMPI-A PSY-5 facet scales: Correlations with externalizing symptoms and features.

	Hostility	Grandiosity	Delinquent	Norm Violation	Low Drive	Low Sociability	Psychotic Beliefs	Odd Mentation	Neuroticism
SCL-90 Hostility	.65**	.31**	.36**	.31**	.41**	.05	.43**	.44**	.52**
YSR Externalizing	.68**	.39**	.59**	.38**	.29**	-.12**	.40**	.40**	.43**
Discharge diagnosis									
Conduct disorder	.08*	.07	-.01	.01	-.03	-.02	.07	.03	.01
HPRS Hostility	.16**	.08*	.09*	.11**	.03	-.01	.08*	.04	-.02
Chart									
Anger outburst	.16**	.12**	.18**	.07	-.10**	-.03	.03	.07	-.09*
Criminal Behavior	.12**	.13**	.28**	.15**	-.05	-.06	.07	.04	-.04
Opposition	.10**	.11**	.28*	.15**	-.08*	-.06	-.04	-.06	-.14**
Runaway	-.01	.05	.19**	.09*	-.09*	-.10	-.04	-.04	-.10**
Truancy	.00	.01	.21**	.12**	-.06	-.04	.00	-.08*	-.09*
Violence	.24**	.17**	.27**	.15**	-.03	.08*	.12*	.02	-.04
Sexually Active	.06	.03	.29**	.35**	-.15**	-.17**	.01	.01	-.10*
SCID PSUD Alcohol									
Experimentation	.16**	.06	.42**	.17**	.01	-.18**	.02	.08	.01
Alcohol Abuse	.10**	.09*	.25**	.07	.08*	-.01	.02	.10*	.08*
Cannabis Experimentation	.12**	.03	.45**	.12**	-.04	-.19**	.04	.10*	.01
Cannabis Abuse	.17**	.10**	.37**	.18**	.09*	-.03	.06	.10**	.06

N = 662. MMPI-A = adolescent version of the Minnesota Multiphasic Personality Inventory; PSY-5 = Psychopathology Five; SCL-90 = Symptom Checklist-90; YSR = Achenbach Youth Self-Report; HPRS = Hopkins Psychiatric Rating Scale; SCID = Structured Clinical Interview for the DSM-IV; PSUD = proactive substance use disorder.
 *p < .01. **p < .001.

TABLE 5.—Regression analyses for PSY-5 facet scales and externalizing self-report measures.

Criterion	Predictor	B	SE	<i>B</i>	<i>t</i>	Adjusted <i>R</i> ²
SCL	Hostility	1.53	.15	.43	10.33**	.495
	Grandiosity	-.16	.25	-.02	-.63	
	Delinquency	.26	.11	.08	2.29*	
	Norm Violation	.14	.52	.01	.27	
	Low Drive	.44	.15	.12	2.90*	
	Low Sociability	-.14	.14	-.03	-.99	
	Psychotic Beliefs	.34	.17	-.08	1.99*	
	Odd Mentation	.42	.32	.05	1.97	
	Neuroticism	.44	.09	.18	1.30	
	Constant	33.71	1.28		26.37	
YSR	Hostility	1.38	.14	.37	9.61**	.579
	Grandiosity	.11	.25	.01	.44	
	Delinquency	1.17	.11	.33	10.44**	
	Norm Violation	.71	.51	.04	1.41	
	Low Drive	.28	.15	.07	1.88	
	Low Sociability	-.52	.14	-.12	-3.83**	
	Psychotic Beliefs	.44	.14	.09	2.62**	
	Odd Mentation	-.11	.17	-.01	-.36	
	Neuroticism	.34	.32	.13	3.71**	
	Constant	37.52	.09		30.09	

Note. PSY-5 = Psychopathology Five; SCL-90-R = Symptom Checklist-90-Revised; YSR = Achenbach Youth Self-Report.
p* < .01. *p* < .001.

An examination of patterns of relationships with chart review reveals the presence of a more differentiated pattern of correlations. Aggressive externalizing behaviors (i.e., angry acting out, oppositional behavior, violent behavior) were more strongly related to Hostility, Grandiosity, Delinquent Attitudes, and Norm Violations facet scales. By contrast, those not involving aggression (i.e., truancy, being sexually active, running away) were only related to Delinquent Attitudes and Norm Violations scales. Interestingly, the presence of experimentation with alcohol and cannabis did include some weak correlations with Hostility in addition to stronger correlations with Disconstraint facet scales. This is consistent with at least some previous research that has indicated the presence of a reciprocal influence between aggression and substance use that may persist through adolescence (White, Loeber, Stouthamer-Loeber, & Farrington, 1999).

Relationships with Internalizing Symptoms and Features

Table 6 reveals a pattern of correlations that is partially consistent with previous findings in that self-report measures of depression and anxiety correlated most strongly with the Neuroticism/Negative Emotionality Higher order scale and to a lesser extent with other PSY-5 scales' facet scales. Counter to hypothesized predictions, the presence of discharge diagnosis of depressive disorder (limited to discharge diagnoses of major depression and dysthymic disorder) demonstrated a small but negative relationship to the Neuroticism/Negative Emotionality factor. Results of regression analysis, presented in Table 7, indicate that Psychotic Beliefs and Odd Mentation facet scales are also associated with self-reported internalizing symptoms. One recent analysis of the SCL-90-R item content using Rasch analysis suggested that the items might best be considered measures of general clinical distress that capture overall levels of functioning (Elliot et al., 2006). One possibility is that elevations on these SCL-90 scale elevations are less reflective of differentiated symptom status and more indicative of the relatively high levels of distress that are being experienced by adolescents who require hospitalization for depressive disorders. It is also likely that many adolescents who are endorsing psychotic symptoms are also more prone to endorse high levels of depression and anxiety. Both Introversion facet scales were also related to both self-report and chart review internalizing symptoms. Across ratings, the pattern is one in which self-report, therapist ratings, and chart indicants of depression are more strongly related to the Low Drive/Expectations facet scale rather than the Low Sociability facet scale. Suicidal ideation, in addition to being associated with Neuroticism and Low Drive, was associated with increased elevations on the Hostility facet scale. These differential patterns highlight the potential clinical value of the PSY-5 facet scales with respect to understanding and prediction of problematic behaviors.

Relationships with Psychotic Symptoms and Bizarre Features

The pattern of intercorrelations in Table 8 is generally consistent with hypothesized predictions in that psychotic symptoms and bizarre features are most strongly and consistently related

TABLE 6.—MMPI-A PSY-5 facet scales: Correlations with internalizing symptoms and features.

	Hostility	Grandiosity	Delinquent	Norm Violation	Low Drive	Low Sociability	Psychotic Beliefs	Odd Mentation	Neuroticism
SCL-90									
Depression	.43**	.21**	.17**	.18**	.53**	.17**	.41**	.48**	.62**
Anxiety	.46**	.26**	.19**	.19**	.46**	.13**	.52**	.53**	.62**
YSR Internalizing	.47**	.21**	.13**	.20**	.56**	.23**	.46**	.52**	.67**
Discharge diagnosis									
Depressive disorder	-.05	.02	.03	-.02	-.06	.04	-.07	-.11**	-.13**
HPRS									
Depression	.03	-.10**	-.12**	.01	.15**	.03	.07	.08*	.18**
Anxiety	.02	-.09*	-.13**	-.05	.10*	.08*	.06	.03	.14**
Chart									
Depressed mood	.00	-.01	-.02	-.00	.11**	.02	.01	.06	.14**
Lethargy	.05	.00	-.05	.03	.21**	.13**	.08*	.13**	.21**
Phobias	-.04	-.06	-.11**	-.01	.04	.14**	-.01	-.01	.03
Poor social skills	.04	.01	-.01	.01	.12**	.14**	.04	.04	.04
Suicidal ideation	.14**	.03	-.12	.02	.22**	.04	.10**	.19**	.27**
Suicide attempts	-.02	-.04	-.13**	-.07	.10	.03	.04	.09*	.09*

Note. *N* = 662. MMPI-A = adolescent version of the Minnesota Multiphasic Personality Inventory; PSY-5 = Psychopathology Five; SCL-90 = Symptom Checklist-90; YSR = Achenbach Youth Self-Report; HPRS = Hopkins Psychiatric Rating Scale.
p* < .01. *p* < .001.

TABLE 7.—Regression analyses for PSY-5 facet scales and internalizing self-report measures.

Criterion	Predictor	B	SE	B	t	Adjusted R ²
SCL-90-R Depression	Hostility	.02	.16	.01	.14	.476
	Grandiosity	.19	.27	.02	.71	
	Delinquency	.15	.12	.04	1.20	
	Norm Violation	-.67	.55	-.04	-1.21	
	Low Drive	1.03	.16	.27	6.46**	
	Low Sociability	.02	.15	.00	.11	
	Psychotic Beliefs	.15	.18	.03	-.84	
	Odd Mentation	1.19	.34	.14	3.48**	
	Neuroticism	1.07	.10	.41	10.86**	
	Constant	34.52			25.31	
SCL-90-R Anxiety	Hostility	.08	.16	.02	.53	.492
	Grandiosity	.25	.27	.03	.93	
	Delinquency	.06	.12	.02	.47	
	Norm Violation	-.57	.55	-.03	-1.03	
	Low Drive	.50	.16	.13	3.13**	
	Low Sociability	-.07	.15	-.02	-.47	
	Psychotic Beliefs	.97	.18	.20	5.29**	
	Odd Mentation	1.37	.34	.15	3.98**	
	Neuroticism	1.03	.10	.39	10.48**	
	Constant	23.87			23.87	
YSR Internalizing	Hostility	.29	.16	.07	1.79	.561
	Grandiosity	.02	.27	.00	.06	
	Delinquency	-.13	.13	-.03	-1.07	
	Norm Violation	-.20	.57	-.01	-.36	
	Low Drive	.90	.16	.21	5.51**	
	Low Sociability	.32	.15	.07	2.08**	
	Psychotic Beliefs	.30	.19	.06	1.62	
	Odd Mentation	1.52	.35	.15	4.31**	
	Neuroticism	1.30	.10	.45	12.86**	
	Constant				23.01	

Note. PSY-5 = Psychopathology Five; SCL-90-R = Symptom Checklist-90-Revised; YSR = Achenbach Youth Self-Report.
*p < .05. **p < .01.

to those facet scales associated with higher order Psychoticism and Introversion scales. Psychoticism facet scales were moderate to strong independent predictors of almost all psychotic features and symptoms. Relationships between facet scales and the presence of a discharge diagnosis of psychotic disorder, although small, were significant and as predicted. Given that this

is the only set of facet scales for which there was a meaningful relationship with discharge diagnosis, it might be hypothesized that the Psychotic Beliefs/Experiences and Odd Mentation facet scales may relate more directly to Axis I disorders than the other facet scales. There were no striking differences in the magnitude of correlations between the Psychotic Beliefs/Experiences and Odd Mentation facet scales and either therapist ratings or chart review variables, suggesting that at least for this group of symptoms, these facet distinctions did not contribute additional diagnostic information. However, within the Introversion facet scales, the Low Drive facet scale was more strongly related to a range of self-reported and observed psychotic manifestations than the Low Sociability facet scale. Analysis of the regression analysis in Table 9 does indicate subtle differences in how the facet scales relate to psychotic manifestations. These analyses indicate the consistent manner in which elevations on the Neuroticism/Negative Emotionality facet scale are associated with vulnerability to both psychotic and paranoid manifestations. This is not inconsistent with previous research with the Five-factor model suggesting that schizotypal personality disorder is associated with high levels of neuroticism and significantly lower levels of extraversion, agreeableness, and conscientiousness (Gurerra et al., 2005). In addition to relationships with Psychoticism and Low Drive facet scales, self-report of psychotic symptoms as measured by the SCL-90-R is associated with lower scores on Norm Violations. By contrast, self-report of paranoid symptoms are associated with both the Grandiosity and Delinquent Attitudes facet scales, perhaps reflecting the grandiose beliefs and misanthropic attitudes more likely to be associated with paranoid manifestations.

DISCUSSION

These findings provide further support for the predictive validity of the MMPI-A PSY-5 facet scales. With the exception of the shorter facet scales, most were found to demonstrate good to excellent internal consistency. The PSY-5 facet scales also related in predictable and similar ways to self-report and symptom ratings as their associated parent scales from the MMPI-A PSY-5 (Ben-Porath et al., 2006). Consistent with previous

TABLE 8.—MMPI-A PSY-5 facet scales: correlations with bizarre features.

	Hostility	Grandiosity	Delinquent	Norm Violation	Low Drive	Low Sociability	Psychotic Beliefs	Odd Mentation	Neuroticism
SCL-90									
Psychosis	.45**	.28**	.20**	.16**	.45**	.15**	.54**	.54**	.57**
Paranoid	.48**	.34**	.29**	.21**	.40**	.12**	.50**	.46**	.50**
YSR									
Thought Problems	.33**	.18**	.19**	.16**	.38**	.15**	.51**	.54**	.40**
Discharge diagnosis									
Psychotic	.08	.05	.01	.00	.12**	.11**	.23**	.21**	.10*
HPRS									
Psychotic Behaviors	.04	.00	-.06	.02	.17**	.12**	.22**	.17**	.08*
Conceptual Dysfunction	.02	.02	-.01	.00	.04	.12**	.13**	.11**	-.02
Disorientation Chart	.00	-.03	-.02	-.01	.07	.06	.12**	.09*	.02
Bizarre Behavior	.03	.03	.02	-.01	.08*	.12**	.11**	.08*	.07
Bizarre Thoughts	-.02	.05	.07	.12	.04	.08*	.17**	.16**	.06
Hallucinations	.19	.09	.07	.12	.24**	.07	.38**	.34**	.20**
Paranoid Ideation	.25	.11	.07	.09	.30**	.13**	.31**	.23**	.26**

Note. N = 662. MMPI-A = adolescent version of the Minnesota Multiphasic Personality Inventory; PSY-5 = Psychopathology Five; SCL-90 = Symptom Checklist-90; YSR = Achenbach Youth Self-Report; HPRS = Hopkins Psychiatric Rating Scale.
*p < .01. **p < .001.

TABLE 9.—Regression analyses for PSY-5 facet scales and self-report measures associated with psychotic disorders.

Criterion	Predictor	B	SE	<i>B</i>	<i>t</i>	Adjusted <i>R</i> ²
SCL-90-R Psychosis	Hostility	.07	.15	.02	.48	
	Grandiosity	.48	.25	.06	1.87	
	Delinquency	.09	.12	.03	.79	
	Norm Violation	-1.10	.52	-.07	-2.06*	
	Low Drive	.52	.15	.14	3.44**	
	Low Sociability	.00	.14	.00	.01	
	Psychotic Beliefs	1.03	.17	.23	5.95**	
	Odd Mentation	1.41	.33	.17	4.32**	
	Neuroticism	.76	.09	.31	8.16**	
	Constant	33.27	1.28		25.81	.476
SCL-90-R Paranoid	Hostility	.24	.16	.07	1.48	
	Grandiosity	.96	.28	.12	3.49**	
	Delinquency	.40	.13	.12	3.13**	
	Norm Violation	-.63	.57	-.04	-1.10	
	Low Drive	.47	.17	.13	2.85**	
	Low Sociability	.09	.15	.02	.59	
	Psychotic Beliefs	1.10	.19	.24	5.80**	
	Odd Mentation	.34	.36	.04	.95	
	Neuroticism	.64	.10	.25	6.24**	
	Constant	31.21	1.42		22.05	.410
YSR Thought Problems	Hostility	-.10	.13	-.04	-.77	
	Grandiosity	.01	.21	.00	.03	
	Delinquency	.12	.10	.05	1.88	
	Norm Violation	-.49	.44	-.04	-1.11	
	Low Drive	.28	.13	.10	2.20*	
	Low Sociability	-.01	.12	-.00	-.06	
	Psychotic Beliefs	.82	.15	.24	5.61**	
	Odd Mentation	1.81	.28	-.29	6.57**	
	Neuroticism	.26	.08	.14	3.26**	
	Constant	46.31	1.09		42.55	.351

Note. PSY-5 = Psychopathology Five; SCL-90-R = Symptom Checklist-90-Revised; YSR = Achenbach Youth Self-Report.

p* < .01. *p* < .001.

research that has used the MMPI PSY-5 model, externalizing problems and symptoms were related most strongly and consistently to facet scales from the Aggressiveness and Disconstraint parent scales. Associations between the Neuroticism factor and externalizing behaviors were also consistent with previous research. Perhaps the range of traits encompassed in the Negative Emotionality/Neuroticism factor makes the combination of Aggressiveness and Disconstraint more maladaptive. Internalizing problems and symptoms were related to the Neuroticism/Negative Emotionality scale as well as the Introversion facet scales and most particularly the Low Drive facet scale. Bizarre behaviors and psychotic symptoms were related most strongly to the Psychotic Beliefs/Experiences, Odd Mentation facet scales, and Low Drive/Expectations facet scale. These findings suggest a differential pattern of correlations among PSY-5 facet scales and broad symptom domains (i.e., internalizing, externalizing, and psychotic disorders). This stands in some contrast to some recent meta-analytic work with the FFM (Malouff et al., 2005), which suggested that symptoms of various clinical disorders were associated with a typical FFM profile of high Neuroticism, low Conscientiousness, low Agreeableness, and low Extraversion. The issue of whether there are unique underlying personality profile patterns that are differentially associated with development of specific clinical syndromes as opposed to a specific personality profile pattern associated with more generalized vulnerability to the development of diverse clinical symptoms is one of particular importance in under-

standing adolescent psychopathology (Krueger, Caspi, Moffitt, & Silva, 1998; Krueger, Caspi, Moffitt, Silva, & McGee, 1996). Further research using configurational profiles with both normal and clinical populations will be needed to explore this issue.

There are three concerns in evaluating the magnitude of effect sizes within this study. First, there are clearly indications of method variance, with markedly greater effect size for self-report criterion measures. In addition to overlap created by response bias features, it is important to note that at least some previous research has demonstrated that the SCL-90-R measures severity of psychopathology in general (Brophy, Norvell, & Kiluk, 1988), with high levels of intercorrelations among subscales (Clark & Friedman, 1983; Holcomb, Adams, & Ponder, 1983) and limited usefulness of subscales for more specific differentiation of populations of clients (Elliot et al., 2006). This may explain the rather diffuse pattern of correlations between the facet scales and self-report on the SCL-90-R. Second, because this study explores relationships within an inpatient sample, effect sizes are likely to be smaller than those obtained by studies that have contrasted clinical and normal populations and may underestimate the utility of these scales (Tabachnik & Fidell, 2001). Finally, it would be anticipated that the PSY-5 scales and facet scales would show even stronger correlations with personality disorders as opposed to Axis I clinical symptoms. Judging from previous research, facet scales should show only low to moderate correlations with Axis I symptoms. At least some previous research from a categorical perspective, with adult populations, has failed to support the hypothesis that there would be associations between Axis I classes of disorders and conceptually similar Axis II clusters (Oldham et al., 1995). Studies that have assessed the relationships between FFM dimensions and Axis I symptoms have more generally found medium to large effect sizes for the Neuroticism Factor and medium effect sizes for other factors in predicting mood disorders and anxiety disorders (Durrett & Trull, 2005; Malouff et al., 2005).

The data from this exploratory correlational analysis do not demonstrate any causal direction between the PSY-5 facet scales and having symptoms of a psychological disorder. As Widiger and Trull (1992) pointed out, the relationship between a trait and a clinical disorder may be one in which the trait contributes to the disorder, the disorder contributes to the trait, or some third variable contributes to both. Additionally, Widiger and Trull suggested that the presence of a trait may affect the presentation or treatment of the disorder. Although the MMPI-A PSY-5 scales show sufficient temporal stability to be viewed as trait-like features (L. A. R. Stein et al., 1998), further research is needed to ascertain the stability of these traits over the course of onset and treatment of Axis I disorders to demonstrate the stability of personality despite variations in symptoms (see Santor, Bagby, & Joffe, 1997).

Consistent with guidelines that have been suggested in previous research (Arnau, Handel, & Archer, 2005; Bolinsky et al., 2004), the limited number of items and low internal consistency for some of the facet scales suggests that until further information is acquired, the most helpful clinical application of these scales will involve clarifying the reasons for clinically significant elevations on the parent scales. However, these findings also suggest that these scales might also have some potential for assessing differential vulnerabilities to psychopathology as well as for conceptualizing adolescent personality disorders from a dimensional perspective. These findings suggest that the Low

Drive/Expectations facet scale might hold promise for identifying personality dimension features that are associated with increased vulnerability to bizarre behaviors and psychotic symptoms or may have some contribution as a prototypal trait domain (Millon, 1986). The combination of high scores on the Low Drive/Expectations scale—when combined with the Neuroticism, Psychotic Beliefs, and Odd Mentation scales—may signal the presence of increased vulnerabilities to psychotic symptoms. By contrast, a Low Drive/Expectations elevation when combined only with elevation on the Neuroticism Factor may signal increased vulnerability to internalizing disorders. Within the realm of psychotic disorders, elevations on the Grandiosity and Delinquency facet scales associated with elevations on the Psychotic Beliefs scale may additionally point to vulnerabilities to a more paranoid presentation. Similarly, the presence of Hostility facet scale elevations and Delinquent Behaviors and Attitudes, as opposed to Norm Violation facet scales, bear further research with respect to how these features may add to the understanding of aggressive versus nonaggressive disruptive behaviors and vulnerability to suicidal ideation as well as alcohol and substance abuse problems. Relationships using the FFM constructs have previously found alcohol and substance abuse dependence to be positively related to the Openness scale and negatively related to the Conscientiousness scale (Trull & Scher, 1994), so these findings provide an alternative model for understanding these behaviors within the PSY-5 model.

Future research exploring the longitudinal stability of the PSY-5 facet scales is needed. One aim of such research would be to explore the relative stability of the PSY-5 traits as opposed to symptoms. Another aim would be to determine whether higher score elevations would be predictive of higher levels of temporal stability. Such research would be helpful in deriving cutoff scores that would allow clinicians to more accurately estimate when a problematic characteristic or trait reaches a level that is likely to be both enduring and problematic. Because each facet scale will not have equivalent implications with respect to adjustment, cluster analytic, configurational, and profile analyses might also be helpful in identifying the relative features associated with combinations of high and low facet scale elevations.

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