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DIMENSIONS OF PERSONALITY PATHOLOGY IN ADOLESCENTS: RELATIONS TO DSM-IV PERSONALITY DISORDER SYMPTOMS

Noor B. Tromp, Msc, and Hans M. Koot, PhD

The aim of the present study was to relate and compare two approaches to personality pathology in adolescents. Dimensions of personality pathology, assessed by the Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents (DAPP-BQ-A; Tromp & Koot, 2008), were related to DSM-IV personality disorder (PD) symptoms in 168 adolescents referred for mental health services. Correlational analyses revealed that the DAPP-BQ-A higher- and lower-order dimensions were related to PD symptoms in predictable ways. Regression analyses showed that for all but three PDs (Schizoid, Schizotypal, and Passive-Aggressive), lower-order dimensions accounted for unique variance, after controlling for gender, age, and co-occurring PD symptoms. It is concluded that dimensional assessment may provide valuable information on adolescent personality pathology, and facilitate the study of developmental antecedents of adult personality pathology.

A growing body of research recognizes the limitations of the categorical classification system of the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 2000) as a diagnostic tool for personality disorders (PD; see Trull & Durrett, 2005; Widiger & Samuel, 2005). Simultaneously, research applying a dimensional approach to PDs has repeatedly provided evidence for a strong and stable dimensional structure underlying DSM defined PD categories (Widiger & Simonsen, 2005). A survey in a diverse group of international PD experts showed that 75% felt that the DSM categorical system of PD classification should be replaced (Bernstein, Iscan, & Maser, 2007). Regarding alternatives, almost 56% of the experts opted for a dimensional system and almost 70% for a mixed system of categories and dimensions. Not surprisingly, a careful but certain movement towards a dimensional approach to personality pathology can be observed in the field of adult psychiatry (see Widiger, Simonsen, Krueger, Livesley, & Verheul, 2005). Similarly, the di-

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dimensional approach may be a valuable alternative to the categorical approach for describing personality pathology in adolescence. For example, knowledge on the structure of adolescent personality pathology is limited (but see De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006), and in applying the DSM criteria and thresholds to adolescent populations, questions on this structure remain unanswered. In addition, possible influences of adolescent psychological development on symptomatology are disregarded when the DSM classification is applied to adolescents. For example, behaviors that are considered pathological in adults may be regarded developmentally appropriate in adolescents (e.g., shyness, identity problems, emotional instability). Finally, an often-heard criticism of the DSM classification is its inability to classify subthreshold traits and symptoms. In applying PD categories, only dysfunction at the severe end of the continuum is assessed, whereas in adolescents, especially those at risk for developing full-blown pathology, dysfunction may not yet have developed to this severe extent. Dimensional models retain important information concealed in subthreshold traits and symptoms (Trull & Durrett, 2005). In the research agenda for the next edition of the DSM, the DSM-V, attention is drawn to the need to study developmental antecedents of personality pathology (First et al., 2002). Childhood and adolescent temperament and personality are regarded by some to be among the best candidates as general broadband developmental antecedents for adult PDs (Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005). In sum, increased knowledge on the structure and manifestations of childhood and adolescent dimensions of personality pathology is warranted.

Several instruments for the dimensional assessment of personality pathology in children and adolescents have been designed, including the Shedler-Westen Assessment Procedure for Adolescents (SWAP-200-A; Westen, Shedler, Durrett, Glass, & Martens, 2003), the Schedule for Nonadaptive and Adaptive Personality Youth Version (SNAP-Y; Linde, Clark, & Simms, 2003), the Dimensional Personality Symptom Item Pool (DIPSI; De Clercq et al., 2006), and the Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents (DAPP-BQ-A; Tromp & Koot, 2008). All four instruments showed adequate psychometric properties (De Clercq et al., 2006; Linde et al., 2003; Tromp & Koot, 2008; Westen et al., 2003). The reported similarities between the factorial structure of personality pathology in childhood, adolescence, and adulthood underscore the need for a developmental perspective on dimensions of personality pathology (De Clercq et al., 2006; Linde et al., 2003; Tromp & Koot, 2008).

To our knowledge, the specific relations between dimensions of personality pathology and PD categories, as described in the DSM-IV, have not been studied in adolescence. Studies in adult samples have shown that the DAPP-BQ dimensions (Livesley & Jackson, in press) are related to the DSM-IV PDs in conceptually meaningful ways (Bagby, Marshall, & Georgiades, 2005; Bagge & Trull, 2003; Pukrop, Gentil, Steinbring, & Steinmeyer, 2001). However, apart from the possible difficulties in generalizing

results across ages, conclusions from these studies are hampered by several limitations. For example, Bagge and Trull and Bagby and colleagues assessed the DSM-IV PD symptoms using self-report measures. It is well-known that self-report questionnaires tend to over-diagnose personality pathology (Hunt & Andrews, 1992). Moreover, relying on the same informant in the assessment of the two constructs examined may spuriously inflate the relation, due to informant bias. In addition, Pukrop and colleagues and Bagby and colleagues only examined the DAPP-BQ's four higher-order dimensions, whereas the 18 lower-order dimensions may provide substantial increase in specificity and discrimination between PDs as well as a richer description of these disorders (cf. Reynolds & Clark, 2001). Finally, both Bagge and Trull and Bagby and colleagues used a student sample. In studies with nonreferred samples it remains unclear to what extent personality pathology leads to distress or impairment, which is one of the general criteria for a PD diagnosis. Thus, whether real personality pathology rather than behavioral phenotypes were under investigation in these studies seems uncertain.

The present study aimed to relate the dimensional and categorical approaches to personality pathology. Several methodological aspects of this study provide the opportunity to considerably expand current knowledge on adolescent personality pathology: It examines the relationships between both higher- and lower-order DAPP-BQ-A dimensions and symptoms counts for all 12 (main text and appendix) DSM-IV PDs, as assessed with a semi-structured interview, in a sample of adolescents referred for in- or outpatient mental health services. Such an empirical investigation can help to understand the manifestations of adolescent PDs when assessed from a dimensional perspective. It also allows for an examination of the value of applying a dimensional approach to personality pathology compared to applying the DSM-IV diagnoses. In addition, given the familiarity among clinicians of the DSM-IV PD diagnoses and symptoms, relating the two approaches seems a logical step toward the implementation of the DAPP-BQ-A in clinical settings. Finally, the obtained relations may provide specific clues for selecting interventions for adolescents with personality pathology.

METHOD

STUDY SAMPLE

The sample consisted of 168 adolescents (35% male), with a mean age of 15.9 years ($SD = 2.3$; range 12 to 22 years), referred for mental health services in one of four collaborating centres for in- and outpatient treatment in The Netherlands. The adolescents were referred for various forms of psychopathology. Axis I disorders, assessed with the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) and parts of the Schedule for Affective Disorders and

Schizophrenia for School-Age Children Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997), were present in 76.8% of the sample at the time of assessment. In addition, 42% were assigned a DSM-IV PD diagnosis, as assessed with the Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II; First, Spitzer, Gibbon, & Williams, 1997), including Paranoid (11%), Schizoid (3%), Schizotypal (1%), Antisocial (14%), Borderline (17%), Narcissistic (1%), Avoidant (15%), Dependent (4%), Obsessive-Compulsive (8%), Depressive (20%), and Passive-Aggressive (7%). Histrionic PD diagnosis did not occur in this sample. Of all participants, 58% had no PD diagnosis, 18% one, 8% two, 5% three, 6% four, 1% five, 2% six, and 1% had seven PD diagnoses. Finally, 17% had no diagnosable Axis I or personality disorder, 38% had both Axis I and personality disorders, 41% had an Axis I but no personality disorder, and 6% had a personality but no Axis I disorder.

MEASURES

All participants completed the DAPP-BQ-A (Tromp & Koot, 2008), which assesses four higher-order and 18 lower-order dimensions of personality pathology. The first higher-order dimension, Emotional Dysregulation, is characterized primarily by ten lower-order dimensions: Submissiveness, Cognitive Distortion, Identity Problems, Affective Instability, Anxiety, Social Avoidance, Suspiciousness, Insecure Attachment, and Self Harm. The second higher-order dimension, Dissocial Behavior, is defined by Stimulus Seeking, Callousness, Rejection, and Conduct Problems. Inhibitedness, the third higher-order dimension, consists of Restricted Expression and Intimacy Problems. Finally, the higher-order dimension Compulsivity, is characterized primarily by the lower-order dimension Compulsivity. The lower-order dimension Oppositionality loads on both Emotional Dysregulation and Dissocial Behavior, whereas Narcissism showed relationships to Emotional Dysregulation, Dissocial Behavior, and Compulsivity. Each lower-order dimension is measured by 16 items describing personal preferences and behaviors, except the scales Self Harm and Suspiciousness, which contain 12 and 14 items, respectively. In addition, eight items are included to measure social desirability. The resulting 290 items are scored on a Likert-type scale, ranging from 1 (very unlike me) to 5 (very like me). The DAPP-BQ-A was translated and adapted from its adult predecessor, the DAPP-BQ (Livesley & Jackson, in press), using procedures described in detail elsewhere (Tromp & Koot, 2008). The DAPP-BQ-A showed adequate psychometric properties.

In addition, all participants were given the Dutch version (Weertman, Arntz, Dreessen, Van Velzen, & Vertommen, 2003) of the SCID-II (First et al., 1997) by one of two trained research psychologists, who were blind to the adolescents' DAPP-BQ-A scores. PD symptom counts were obtained by computing for each PD the total number of diagnostic criteria that were met (threshold or true). Research has indicated that structured clinical

interviews can be used to assess PDs among adolescents in a reliable and valid manner (Brent, Zelenak, Bukstein, & Brown, 1990; Brent et al., 1993; Grilo, Becker, Edell, & McGlashan, 2001).

PROCEDURE

Participants completed the questionnaire at home or at the mental health center in paper-and-pencil format (68%) or via internet (32%). Both groups did not differ on either gender or age. However, they did differ significantly on the DAPP-BQ-A dimensions Self Harm and Stimulus Seeking (Cohen's $d = .39$), Restricted Expression ($d = .40$), and Conduct Problems ($d = .50$), indicating higher scores for the adolescents in the paper-and-pencil group. These differences did not seem to represent systematic methodological effects. ANOVA's showed that the effects were attributable to the scores of inpatients, the large majority of whom (87%) used paper-and-pencil format. Only for Conduct Problems a small but significant interaction effect of assessment format by referral status was found ($\eta^2 = 0.03$), indicating that the effect of assessment format was only significant for inpatients. Subsequently, the structured interview was administered at the mental health center. After completing all assessments, adolescents received a voucher worth €15,-. Study procedures were approved in accordance with appropriate Dutch national guidelines by the Central Committee on Research involving Human Subjects.

STATISTICAL ANALYSES

Because several cross-loadings appeared in the factor structure (cf. Tromp & Koot, 2008), factor scores were computed on each higher-order dimension for each participant. Next, partial correlations were computed between the higher-order dimension factor scores and lower-order dimension scores on the one hand and the symptom counts for each of the twelve DSM-IV PDs on the other, controlling for gender and age. Subsequently, a series of hierarchical multiple regression analyses was conducted with symptom counts for each PD as dependent variable, including all 18 lower-order dimensions as predictors in the analyses. In the first series, after entering gender and age into the model, the DAPP-BQ-A lower-order dimensions were entered as one block to determine if a significant amount of variance in PD symptom counts could be accounted for by these dimensions, above and beyond gender and age effects. In the second set of analyses, gender and age were entered first, followed by a block including all co-occurring PD symptoms, which in turn was followed by a block including all DAPP-BQ-A lower-order dimensions. Individual beta weights of the DAPP-BQ-A lower-order dimensions were then evaluated to see which dimensions uniquely ($p < .05$) contributed to the model.

RESULTS**HIGHER-ORDER DIMENSIONS**

Table 1 presents the zero-order correlations between the four DAPP-BQ-A higher-order dimension factor scores and the symptom counts of the twelve DSM-IV PDs. When the specific PDs are grouped into the three DSM-clusters, the results showed that all disorders within the odd/eccentric cluster (Paranoid, Schizoid, and Schizotypal) showed positive correlations with Inhibitedness; all PDs within the dramatic/erratic cluster (Antisocial, Borderline, Histrionic, and Narcissistic) showed positive correlations with Dissocial Behavior; and all PDs within the fearful/anxious cluster (Avoidant, Dependent, and Obsessive-Compulsive) as well as Depressive and Passive-Aggressive PD showed positive correlations with Emotional Dysregulation.

LOWER-ORDER DIMENSIONS

Table 2 presents the partial correlations (controlling for gender and age) between the 18 DAPP-BQ-A lower-order dimensions and the symptom counts of the twelve DSM-IV PDs. The results of two series of hierarchical multiple regressions are presented in Table 3. As the multicollinearity statistics yielded nonsignificant results, (all variance inflation factors [VIF] <10, and mean VIF = 3.16, Myers, 1990; Bowerman & O'Connell, 1990), all 18 lower-order dimensions were included as predictor variables. The first series revealed that the lower-order dimensions combined accounted

TABLE 1. Partial Correlations Between DAPP-BQ-A Higher-Order Dimensions and DSM-IV Personality Disorder Symptom Counts

Symptom counts	Higher-order dimensions			
	Emotional Dysregulation	Dissocial Behavior	Inhibitedness	Compulsivity
PAR	.42***	.34***	.29***	-.05
SZD	.08	.07	.31***	-.04
SZT	.46***	.20**	.27***	-.18*
ANT	.14	.59***	.22**	-.26***
BPD	.58***	.37***	.20**	-.34***
HIS	.17*	.27***	.14	-.02
NAR	.20**	.40***	.21**	.07
AVD	.53***	-.00	.37***	-.08
DEPT	.48***	.11	.14	-.09
OCPD	.28***	.25***	.13	.12
DEPR	.66***	.16*	.33***	-.23**
PA	.40***	.39***	.13	-.16*

Note. Analyses controlled for gender and age. PAR = Paranoid, SZD = Schizoid, SZT = Schizotypal, ANT = Antisocial (A-criteria), BPD = Borderline, HIS = Histrionic, NAR = Narcissistic, AVD = Avoidant, DEPT = Dependent, OC = Obsessive Compulsive, DEPR = Depressive, PA = Passive Aggressive.
*** $p < .001$; ** $p < .01$; * $p < .05$.

TABLE 2. Partial Correlations Between DAPP-BQ-A Lower-Order Dimensions and DSM-IV Personality Disorder Symptom Counts

Dimensions	Symptom counts											
	PAR 1.14 (1.58)	SZD .57 (1.02)	SZT .85 (1.09)	ANT .92 (1.55)	BPD 1.93 (2.43)	HIS .22 (.56)	NAR .37 (.82)	AVD 1.47 (1.81)	DEPT .84 (1.49)	OCPD 1.11 (1.37)	DEPR 2.06 (2.17)	PA 1.10 (1.39)
Submissiveness 41.1 (13.2)	.28***	.08	.32***	-.02	.38***	.25**	.12	.48***	.53***	.21**	.45***	.22**
Cognitive Distortion 40.5 (14.2)	.41***	.17*	.51***	.26**	.59***	.17*	.24**	.42***	.37***	.33***	.54***	.37***
Identity Problems 46.6 (11.1)	.39***	.17*	.40***	.20**	.48***	.13	.22**	.50***	.31***	.30***	.62***	.39***
Affective Instability 48.9 (13.6)	.46***	.09	.41***	.28***	.59***	.17*	.29***	.36***	.35***	.41***	.57***	.48***
Oppositionality 45.4 (12.1)	.28***	.03	.27***	.23**	.39***	.16*	.24**	.25**	.28***	.22**	.39***	.31***
Anxiety 50.2 (16.6)	.38***	-.06	.34***	-.04	.41***	.10	.19*	.45***	.34***	.29***	.59***	.36***
Social Avoidance 44.7 (14.5)	.38***	.20*	.40***	.03	.35***	.16*	.24**	.62***	.39***	.28***	.51***	.28***
Suspiciousness 36.7 (11.4)	.59***	.17*	.49***	.26**	.55***	.19*	.36***	.51***	.41***	.32***	.60***	.44***
Insecure Attachment 43.8 (15.4)	.33***	-.13	.29***	.20*	.40***	.24**	.25**	.21**	.41***	.15	.37***	.34***
Narcissism 42.4 (12.3)	.24**	-.02	.18*	.19*	.23**	.36***	.37***	.18*	.34***	.28***	.24**	.30***
Self Harm 29.3 (17.0)	.44***	.17*	.42***	.34***	.60***	.23**	.28**	.47***	.35***	.26**	.66***	.41***
Stimulus Seeking 45.9 (12.7)	.35***	.03	.25**	.52***	.49***	.16*	.19*	.11	.25**	.23**	.22**	.37***
Callousness 33.5 (11.2)	.28***	.12	.22**	.46***	.27***	.29***	.43***	.07	.06	.20*	.17*	.26**
Rejection 42.6 (11.6)	.26**	.03	.01	.28***	.12	.13	.30***	-.09	-.05	.31***	.05	.27***
Conduct Problems 31.5 (12.9)	.40***	.13	.35***	.65***	.51***	.27***	.37***	.20**	.27**	.22**	.36***	.46***
Restricted Expression 46.6 (8.5)	.29***	.12	.24**	.07	.19*	.03	.08	.40***	.16*	.02	.31***	.10
Intimacy Problems 41.4 (9.1)	.31***	.13	.31***	.30**	.36***	.28***	.26**	.22**	.35***	.22**	.36***	.29***
Compulsivity 44.0 (11.3)	.08	.03	-.01	-.15	-.05	-.06	.05	.13	.06	.24**	.06	-.04

Note. Analyses controlled for gender and age. Means and standard deviations are presented below the DAPP-BQ-A dimensions and SCID-II symptom counts. PAR = Paranoid; SZD = Schizoid; SZT = Schizotypal; ANT = Antisocial (A-criteria); BPD = Borderline; HIS = Histrionic; NAR = Narcissistic; AVD = Avoidant; DEPT = Dependent; OC = Obsessive Compulsive; DEPR = Depressive; PA = Passive Aggressive.

*** $p < .001$; ** $p < .01$; * $p < .05$.

for a significant amount of variance in symptom counts for all but one PD (Schizoid), after controlling for gender and age. The adjusted R^2 change ranged from .05 for Schizoid to .50 for Borderline, with a median value of .31. In the second series, after controlling for gender, age, and co-occurring PD symptoms, lower-order dimensions still accounted for a significant amount of variance in symptom counts for all PDs, with the exception of Schizoid, Schizotypal and Passive-Aggressive PDs. The adjusted R^2 change ranged from .03 for Schizoid, Schizotypal, and Passive-Aggressive to .28 for Antisocial, with a median value of .13.

Examination of the individual beta weights of the DAPP-BQ-A lower-order dimensions showed that Suspiciousness, Rejection, Anxiety, and low Narcissism uniquely ($p < .05$) contributed to variance in Paranoid PD;

Conduct Problems to Antisocial; Affective Instability, Cognitive Distortion, Self Harm, Stimulus Seeking, low Anxiety, and low Compulsivity to Borderline; Narcissism, Submissiveness, Self Harm, and Callousness to Histrionic; Callousness, Narcissism, low Submissiveness, low Identity Problems, and low Stimulus Seeking to Narcissistic; Social Avoidance, low Callousness, and low Intimacy Problems to Avoidant; Submissiveness, Insecure Attachment, Narcissism, low Callousness, and low Rejection to Dependent; Rejection, Compulsivity, low Conduct Problems, and low Restricted Expression to Obsessive-Compulsive; and Self Harm, Identity Problems, and low Stimulus Seeking to Depressive PD.

DISCUSSION

This study examined the relations between dimensions of personality pathology, as assessed by the DAPP-BQ-A, and interview-based DSM-IV PD symptoms in referred adolescents. Correlations between PD symptom counts and the DAPP-BQ-A dimensions largely showed conceptually consistent patterns. For example, in terms of higher-order dimensions, Schizoid correlated highest with Inhibitedness; Antisocial with Dissocial Behavior; and Borderline and Depressive with Emotional Dysregulation. Given the considerable overlap between PDs within the three DSM clusters (odd/eccentric, dramatic/erratic, and fearful/anxious) in terms of their correlations with higher-order dimensions, it seemed hard to differentiate between specific PDs based only on those higher-order dimensions. Therefore, additional analyses were conducted to examine the relations between the 18 lower-order dimensions and PD symptom counts, which again showed conceptually consistent patterns. For example, Paranoid PD symptoms correlated highly with Suspiciousness, Schizotypal with Cognitive Distortion, Antisocial with Conduct Problems, Avoidant with Social Avoidance, and Dependent with Submissiveness.

The relations between DAPP-BQ-A lower-order dimensions and PD symptoms were further examined by conducting a series of hierarchical regression analyses to investigate which dimensions uniquely contributed to variance in symptom counts for specific PDs. Results showed that for all but three PDs, which were Schizoid, Schizotypal, and Passive-Aggressive, at least one lower-order dimension accounted for unique variance, after controlling for gender, age, and co-occurring PD symptoms. Apart from relations with conceptually consistent core features of each specific PD, correlational and regression analyses yielded information on additional clinically important dimensions.

Results of this study were largely consistent with the results reported for adults (Bagge & Trull, 2003). In contrast to previous studies in adults (Bagby et al., 2005; Bagge & Trull, 2003; Pukrop et al., 2001), no significant correlation was found between Obsessive-Compulsive PD symptoms and higher-order Compulsivity. This may have been caused by co-occur-

TABLE 3. Hierarchical Multiple Regressions of DSM-IV Personality Disorder Symptom Counts on DAPP-BQ-A Lower-Order Dimensions

Symptom count	Step; predictors	$\Delta R^2(\text{adj})$	ΔF	Significant DAPP-BQ-A predictors (β)
PAR	2. DAPP-BQ-A dimensions	.35	5.89***	Suspiciousness (.49)
PAR	2. Non-PAR symptoms	.53	180.71***	
	3. DAPP-BQ-A dimensions	.08	2.77***	Suspiciousness (.36), Anxiety (.30), Rejection (.18), Narcissism (-.17)
SZD	2. DAPP-BQ-A dimensions	.05	1.52	Insecure Attachment (-.34)
SZD	2. Non-SZD symptoms	.10	20.27***	
	3. DAPP-BQ-A dimensions	.03	1.30	Insecure Attachment (-.34)
SZT	2. DAPP-BQ-A dimensions	.29	4.82***	Cognitive Distortion (.40), Suspiciousness (.29), Rejection (-.20)
SZT	2. Non-SZT symptoms	.51	180.75***	
	3. DAPP-BQ-A dimensions	.03	1.60	Cognitive Distortion (.37), Rejection (-.19)
ANT	2. DAPP-BQ-A dimensions	.41	7.90***	Conduct Problems (.45)
ANT	2. Non-ANT symptoms	.23	55.56***	
	3. DAPP-BQ-A dimensions	.28	6.87***	Conduct Problems (.42)
BPD	2. DAPP-BQ-A dimensions	.50	10.57***	Affective Instability (.33), Self Harm (.30), Stimulus Seeking (.20), Anxiety (-.30)
BPD	2. Non-BPD symptoms	.52	194.54***	
	3. DAPP-BQ-A dimensions	.13	4.81***	Affective Instability (.28), Cognitive Distortion (.18), Self Harm (.18), Stimulus Seeking (.16), Anxiety (-.23), Compulsivity (-.12)
HIS	2. DAPP-BQ-A dimensions	.22	3.50***	Self Harm (.36), Narcissism (.34), Submissiveness (.32), Compulsivity (-.18)
HIS	2. Non-HIS symptoms	.20	41.17***	
	3. DAPP-BQ-A dimensions	.13	2.67***	Narcissism (.32), Submissiveness (.30), Self Harm (.25), Callousness (.22)
NAR	2. DAPP-BQ-A dimensions	.26	4.33***	Narcissism (.27), Self Harm (.24), Callousness (.26), Identity Problems (-.35), Submissiveness (-.30)
NAR	2. Non-NAR symptoms	.29	69.50***	
	3. DAPP-BQ-A dimensions	.13	3.11***	Callousness (.27), Narcissism (.24), Submissiveness (-.34), Identity Problems (-.29), Stimulus Seeking (-.24)
AVD	2. DAPP-BQ-A dimensions	.39	7.76***	Social Avoidance (.55), Self Harm (.23), Suspiciousness (.21)
AVD	2. Non-AVD symptoms	.33	95.22***	
	3. DAPP-BQ-A dimensions	.21	6.07***	Social Avoidance (.43), Callousness (-.17), Intimacy Problems (-.15)
DEPT	2. DAPP-BQ-A dimensions	.33	6.04***	Submissiveness (.34)
DEPT	2. Non-DEPT symptoms	.39	122.67***	
	3. DAPP-BQ-A dimensions	.15	4.41***	Submissiveness (.34), Insecure Attachment (.16), Narcissism (.15), Callousness (-.17), Rejection (-.15)
OC	2. DAPP-BQ-A dimensions	.20	3.38***	Social Avoidance (.28), Restricted Expression (-.23)

(continued)

TABLE 3. Continued

Symptom count	Step; predictors	$\Delta R^2(\text{adj})$	ΔF	Significant DAPP-BQ-A predictors (β)
OC	2. Non-OC symptoms	.28	66.61***	
	3. DAPP-BQ-A dimensions	.11	2.72***	Rejection (.24), Compulsivity (.20), Conduct Problems (-.22), Restricted Expression (-.18)
DEPR	2. DAPP-BQ-A dimensions	.47	10.53***	Self Harm (.41), Suspiciousness (.22)
DEPR	2. Non-DEPR symptoms	.51	198.07***	
	3. DAPP-BQ-A dimensions	.13	4.94***	Self Harm (.27), Identity Problems (.21), Stimulus Seeking (-.17)
PA	2. DAPP-BQ-A dimensions	.29	4.74***	Conduct Problems (.25), Restricted Expression (-.19)
PA	2. Non-PA symptoms	.42	123.81***	
	3. DAPP-BQ-A dimensions	.03	1.51	none

Note. Analyses controlled for gender and age (step 1 in both series). In the first series, step 2 $df = 18, 147$. In the second series, step 2 $df = 1, 164$; step 3 $df = 18, 146$. β = standardized regression coefficient. PAR = Paranoid; SZD = Schizoid; SZT = Schizotypal; ANT = Antisocial (A-criteria); BPD = Borderline; HIS = Histrionic; NAR = Narcissistic; AVD = Avoidant; DEPT = Dependent; OC = Obsessive Compulsive; DEPR = Depressive; PA = Passive Aggressive. *** $p < .001$; ** $p < .01$; * $p < .05$.

ring PD symptoms or by cross-loadings of Compulsivity on other higher-order dimensions. The results of the correlational and regression analyses with lower-order Compulsivity did show the expected relation, which seems to support this explanation. Another correlation that was reported in all three adult studies but was not replicated in the present adolescent sample was between Histrionic and Inhibitedness (negative). This may have been caused by limited reliability of the assessment of Intimacy Problems, one of only two lower-order dimensions within Inhibitedness, when using the DAPP-BQ-A in its present form, as discussed elsewhere (Tromp & Koot, 2008).

Substantial relationships between the DAPP-BQ-A dimensions and PD symptoms are to be expected, since the original DAPP-BQ items (Livesley & Jackson, in press) were derived through content analysis of the clinical literature on DSM PDs. The present study sheds light on a more interesting issue, concerning the advantages of applying a dimensional approach to personality pathology over applying the DSM-IV diagnoses. The DSM system has been criticized for its high degrees of co-occurrence across PD diagnoses, substantial heterogeneity within PD categories, loss of information, and inadequate coverage (Trull & Durrett, 2005; Widiger & Samuel, 2005). In view of these criticisms, a dimensional approach may offer a viable alternative. For example, the relationships between the DAPP-BQ-A dimensions and PD symptoms offer insight into the problem of co-occurrence. In the present sample, 23% of adolescents had two or more PD diagnoses. Research in adults has suggested that almost all PDs show strong positive relationships with Emotional Dysregulation (Bagby et al., 2005; Bagge & Trull, 2003), and with related constructs such as the Negative

Temperament scale from the SNAP (Morey et al., 2003). The present findings show that Emotional Dysregulation plays a similar role in adolescent PDs, with significant positive correlations for ten of the twelve assessed PDs.

At the same time, assessment of dimensions at the lower-order level provides a more comprehensive picture of personality pathology. Distinctive characteristics of specific PDs may be identified despite similarities in underlying features at the higher- or lower-order level. For example, the results from the regression analyses showed that both adolescents with Histrionic and adolescents with Narcissistic PD symptoms were characterized by narcissistic tendencies (Narcissism) and lack of empathy for other people (Callousness). However, those with Histrionic symptoms appeared submissive and suggestible (high Submissiveness), whereas those with Narcissistic symptoms appeared assertive and not easily influenced (low Submissiveness). Similarly, although both adolescents with Borderline and adolescents with Depressive PD symptoms showed self-harming behavior or thoughts (Self Harm), those with Borderline seemed to crave excitement and act impulsively (high Stimulus Seeking), whereas those with Depressive seemed to avoid being reckless (low Stimulus Seeking).

Assessment at the lower-order level may also solve the problem of substantial heterogeneity within DSM-IV PD categories. Instead of applying a single label, the complexity of personality pathology may be better captured by comprehensive dimensional profiles. Other pathological dimensions that may require clinical attention, apart from the core features captured by the DSM-IV diagnostic label, may be identified and hence, clinically important information is maintained. A related issue is that dimensional assessment may provide an answer to the problem of inadequate coverage through a more comprehensive assessment of the constellation of maladaptive (and adaptive) personality traits. In sum, a dimensional approach to personality pathology seems to have advantages over or in addition to applying the DSM diagnoses.

The results of the present study showed striking parallels with many of the conceptual relations between DAPP dimensions and PD criteria described in a recent article by Livesley (2007). This seems to support the validity of the dimensional approach to personality pathology in adolescence. Also, it provides preliminary confirmation of the possibilities of an integrated framework combining categorical and dimensional diagnoses as proposed by Livesley (2007).

This study's results may enhance the acceptance of the dimensional approach to the assessment of personality pathology in adolescents, since they show how the dimensions map onto the broadly used DSM-IV PD diagnoses. For example, the present results showed that manifestations of adolescent Paranoid PD were mistrust of other people's intentions (Suspiciousness), hypervigilance (Rejection), and trait anxiety (Anxiety). Based on the item content of these dimensions, paranoid adolescents appear as being interpersonally hostile and rejecting other people, possibly as a re-

sponse to perceived threat. They do not seem to rely on other people's approval for their feeling of self-worth. Similarly, manifestations of most other specific adolescent PDs were identified. This can provide clinicians with clear behavioral descriptions of personality pathology in adolescents and thereby with specific indications for treatment interventions.

The statistical power of this study was limited and multiple testing carried the hazard of capitalizing on chance. To our knowledge, the present study is the first to assess the relations between the dimensional and categorical approach exclusively in adolescents. No specific hypotheses for the regression analyses were generated since a priori exclusion of dimensions based on these hypotheses may have led to incomplete results. Although Bagge and Trull (2003) did present hypothesized relations, it was unclear from which sources they derived their hypotheses. Also, a literature search on several of Livesley and coworkers' publications (Livesley & Schroeder, 1990, 1991; Livesley, Jackson, & Schroeder, 1989, 1992) did not yield hypothesized relations between DAPP-BQ lower-order dimensions and DSM-IV PDs similar to those maintained by Bagge and Trull. Therefore, an exploratory approach was applied and, after testing for multicollinearity, all 18 lower-order dimensions were included in the regression models. Despite the methodological limitations, the results of the present study largely converged with those obtained by Bagge and Trull. Replication of our findings in larger adolescent referred samples is warranted. Future studies with larger samples also have the opportunity to conduct discriminative analyses by comparing specific PDs. Another interesting issue, which was not addressed in the present study due to limited power, is the examination of gender differences in the dimensional expression of adolescent PDs.

A unique contribution of this study was the investigation of the relations between dimensions of personality pathology and DSM-IV defined PD symptoms in an adolescent sample. The results showed that dimensions constituting adult PDs are identifiable as early as adolescence. The present study provides indications in terms of the dimensions that may contribute to the development of personality pathology. An issue that needs to be examined in the future concerns the trajectories these personality dimensions may follow toward pathology and functional impairment. An implication of the present findings is that such examinations need not be limited to adulthood, but should instead encompass adolescence.

In conclusion, the results of the present study showed conceptually meaningful relations between dimensions of personality pathology and DSM-IV PD symptoms in adolescents, although less convincingly so for Schizoid, Schizotypal, and Passive-Aggressive PDs. The dimensional approach to personality pathology, represented by the DAPP-BQ-A, seems a promising alternative to applying the PD diagnoses described in the DSM-IV to adolescents. Given its advantages over the DSM categories, studies on the developmental antecedents of adult personality pathology may benefit from applying a dimensional approach. Assessment with the DAPP-BQ

can provide clinicians with valuable information on personality pathology and subsequently with specific clues for selecting trait-oriented interventions.

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