

# Personality subtypes in adolescents with panic disorder

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## Abstract

This study examined personality subtypes of adolescents diagnosed with Panic Disorder (PD). As part of an NIMH-funded study of adolescent personality and its relation to psychopathology, randomly selected experienced licensed psychologists and psychiatrists used a Q-sort instrument to describe adolescents in their care, of whom 57 had been diagnosed with PD. Q-factor analysis yielded three personality subtypes: *High Functioning/Dysphoric*, *Emotionally Dysregulated*, and *Avoidant*. The subtypes differed on axis I and II pathology, adaptive functioning, and developmental and family history variables. Personality constellations showed substantial incremental validity in predicting adaptive functioning above and beyond DSM-IV axis I diagnoses. The results resemble subtypes recently identified in adults and suggest that adolescents who present with panic symptoms are a heterogeneous group, whose personality needs to be considered in understanding and helping them clinically.

## Keywords

adolescents, panic disorder, personality pathology, Q factor analysis, subtypes

## Introduction

Panic Disorder (PD) is a well established and well researched psychiatric disorder among adults, with estimated lifetime prevalence rates of 4.7 percent and 12-month rates of 2.8 percent in the general population (Kessler et al., 2006). Patients often vary in their frequency and severity of panic symptoms, as well as in overall global functioning and comorbidity with other disorders, making PD a complex and heterogeneous disorder (Barlow, Brown, & Craske, 1994; Powers & Westen, 2009). High rates of comorbidity with depression and other anxiety disorders (32–50% and 21–31%, respectively), as well as axis II disorders (35–40%), has made the treatment of PD an important area of focus for researchers (Diler et al., 2004; Kessler et al., 2006; Ozkan & Altindag, 2005). Current research has shown that anxiety disorders, including PD, often emerge in early to late adolescence (Clark, Smith, Neighbors, Skerlec, & Randall, 1994; Kessler, Berglund, Demler, Jin, & Walters, 2005). Some anxiety disorders (e.g., social and specific phobia) have early age-of-onset distributions, with median age ranging from 7 to 13. Other disorders, like Posttraumatic

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Stress Disorder and PD, have a later average age-of-onset with greater variability in age range (from 16 to 26) (Kessler et al., 2005). Overall, the prevalence of anxiety disorders in adolescence ranges from 5.7 to 10.8 percent (Colman, Wadsworth, Croudace, & Jones, 2007).

PD is an important disorder to understand in adolescents, given its estimated prevalence rates among adolescents at 1 percent, the extremely distressing nature of PD symptoms, and the fact that PD puts these young individuals at an increased risk for other psychiatric disorders during both adolescence and adulthood (Diler et al., 2004; Doerfler, Connor, Volungis, & Toscano, 2007). Up to 90 percent of adolescent PD patients are diagnosed with another psychiatric disorder in addition to PD (Doerfler et al., 2007), suggesting that panic tends not to be a discrete disorder in children and adolescents. Understanding that comorbidity and the heterogeneity of presentation it creates may have important implications for treatment, given that PD is unlikely to be an isolated symptom in adolescents that can be treated independent of the personality or other psychopathology that may be present and may provide part of the context for panic symptoms.

### *The importance of personality in PD*

Although child clinicians have long understood the importance of familial context (whether family dynamics or family history) in understanding and treating psychopathology, research has increasingly implicated personality as a crucial context for the development and presentation of axis I disorders (Krueger, 2005). Most clinicians have seen adolescents with PD, for example, who are high functioning, and for whom panic is their only or primary symptom. Others have borderline features or meet adult criteria for Borderline Personality Disorder (BPD), and panic is just part of a pervasive pattern of emotional dysregulation. Although the importance of panic is clear in both cases, understanding different etiologic pathways to the disorder, different clinical presentations, and different prognoses or likelihood of response to particular treatments may be obscured by focusing on the axis I symptoms in isolation.

While PD has been well represented in treatment efficacy studies (Addis et al., 2006; Landon & Barlow, 2004; Mitte, 2005), none have examined how personality differences may have impacted efficacy results of a given treatment. Recent research by Milrod et al. (2007) showed that brief psychodynamic therapy was an effective treatment for PD (compared to applied relaxation treatment), suggesting that different types of therapy (e.g., cognitive-behavioral versus psychodynamic) may target the problem of panic in different ways, and may interact differently with the individual differences of a given patient. Thus, success rates of a particular therapeutic technique may be increased by understanding the heterogeneity of PD and what role personality could play during treatment.

A recent study by our research group (Powers & Westen, 2009) examined personality subtypes in adult patients with PD and found four subtypes: a *High-Functioning group* characterized by a healthy personality structure, an *Emotionally Dysregulated group* with features generally characteristic of BPD, an *Avoidant group*, characterized by feelings of inadequacy, shame and guilt, and a *Somatizing group* characterized by chronic anxiety, hypochondriasis, and obsessionality. Patients who strongly matched one or another of these diagnostic prototypes differed substantially on axis I comorbidity, etiology, global functioning, and treatment outcome, suggesting that the heterogeneity of personality among adult panic patients is patterned, not random, and is tremendously relevant to clinical practice.

### *The present study*

The goal of the present study is to see whether personality subtypes exist in adolescents with PD that may be clinically meaningful. We report data drawn from a broader NIMH-funded study of

adolescent personality pathology. To identify personality subtypes, we applied an empirical clustering technique, Q-factor analysis, to data from the second edition of the Shedler-Westen Assessment Procedure (Westen & Shedler, 1999a), the SWAP-II-A. Our general data-analytic strategy was first to see whether personality subtypes emerged, and if so, to provide an initial test of the validity of the diagnostic groupings, comparing the subtypes on variables that should distinguish a valid taxonomy. These include measures of: (a) adaptive functioning; (b) axis I comorbidity; (c) axis II pathology; and (d) etiological variables such as developmental and family history. We then used hierarchical linear regression to examine the incremental validity of this subtyping approach, that is, whether it predicts clinically important outcomes above and beyond the axis I comorbidity, which provides a conservative test of its potential clinical and empirical utility.

## Method

Among a large sample of adolescents being treated in the community ( $N = 950$ ), 57 were diagnosed by the treating clinician as meeting DSM-IV criteria for PD using conservative diagnostic methods designed to elicit few false positives (see 'Discussion' below). We used a practice network approach, in which randomly selected, experienced clinicians provide data on patients that can be aggregated for large- $N$  research on the nature, classification, and treatment of psychopathology (see Dutra, Campbell, & Westen, 2004; Westen & Shedler, 1999a, 1999b; Westen, Shedler, Durrett, Glass, & Martens, 2003; Westen & Weinberger, 2005).

## Sample

As part of an NIMH-funded project on the classification and diagnosis of personality pathology (Westen & Shedler, 2007), we contacted a random national sample ( $N = 950$ ) of psychiatrists and psychologists with at least five years' experience post-residency (MDs) or post-licensure (PhDs) from the membership registers of the American Psychiatric and American Psychological Associations. We selected all clinicians whose membership records indicated an interest in children or adolescents, and supplemented this where necessary with a general sample, given that many clinicians treat adolescents as well as adults. We sent letters to randomly selected practicing clinicians briefly describing the study and inviting them to participate. The response rate was approximately 35 percent. Participating clinicians received a consulting fee of \$200 for a procedure that required approximately two hours of their time.

We asked clinicians to describe "an adolescent patient you are currently treating or evaluating who has enduring pattern of thoughts, feeling, motivation or behavior – that is, personality patterns – that cause distress or dysfunction". To avoid biasing the sample one way or another, we instructed clinicians to disregard the caveats in the DSM-IV regarding the application of axis II diagnoses to adolescents and simply to select a patient with any degree or form of personality pathology as defined above. We obtained a stratified random sample, stratifying on age (13–18) and sex. The only exclusion criteria were chronic psychosis and mental retardation. In addition, we asked clinicians to select a patient whose personality they felt they knew, using as a guideline  $\geq 6$  clinical contact hours but  $\leq 2$  years (to minimize confounds imposed by personality change with treatment). To minimize selection biases, we directed clinicians to consult their calendars to select the last patient they saw during the previous week who met study criteria, regardless of setting (e.g., private practice, residential facility).

Clinicians received a packet containing the following items: cover letter, consent form, postage-paid return envelope, and study measures. Clinicians were offered the option to alternatively participate via the internet, using our secure website ([www.psychsystems.net](http://www.psychsystems.net)) to encourage

ease and participation. Analysis of the current data, as well as past meta-analytic findings, found no differences between paper and web responses (Butcher, Perry, & Atlis, 2000).

### Measures

We describe here the measures relevant to the present study.

**PD diagnosis.** To determine whether patients had PD, we used data from the Clinical Data Form for Adolescents (CDF-A), which includes a checklist of axis I disorders coded present/absent. Thus, we selected all patients from the broader sample who clinicians indicated met criteria for PD. Recently completed research from our lab finds that clinicians' diagnoses (particularly on a disorder with as clear symptoms as panic, which patients usually articulate as their presenting problem) not only correlate strongly with DSM-IV diagnoses made using structured DSM-IV symptom checklists but better predict self-reported symptoms than do diagnoses made using the DSM-IV criteria, which "lose" many patients with pathology that just misses diagnostic thresholds. We discuss the limitations of this method and future directions in the 'Discussion' below.

**Shedler-Westen Assessment Procedure for Adolescents, Version II (SWAP-II-A).** The SWAP-II is the most recent version of the SWAP-200 and includes a version for adolescents, the SWAP-II-A (Westen et al., 2003). The SWAP-II-A is a 200-item personality pathology Q-sort designed to be used by clinically experienced observers based on longitudinal information over the course of treatment or a systematic clinical diagnostic interview of the patient and parents (Peart & Westen, 2006; Westen & Muderrisoglu, 2007). The SWAP-II-A is a set of 200 personality-descriptive statements, each printed on a separate index card. To describe a patient using the SWAP-II-A, the clinician sorts the statements into eight categories based on their applicability to the patient, from those that are least descriptive (assigned a value of 0) to those that are most descriptive (assigned a value of 7). Statements that apply to a greater or lesser degree are placed in intermediate categories. Both the adult and adolescent versions of the SWAP show considerable evidence of reliability and validity, predicting a range of measures of adaptive functioning (e.g., history of hospitalizations, school performance, violence), general psychopathology (e.g., the CBCL), etiological variables (e.g., childhood history of physical and sexual abuse, family history of internalizing and externalizing disorders), and personality as assessed by independent interviewers blind to clinician data (Peart & Westen, 2006). SWAP-II-A statements are written in a manner close to the data (e.g., "Tends to run away from home"), and items that require inference about internal processes are stated in simple language without jargon (e.g., "Tends to blame others for own failures or shortcomings; tends to believe his/her problems are caused by external factors"). Thus, clinicians can use the SWAP-II-A regardless of their theoretical orientation. Empirically, clinicians' theoretical orientation appears to have little impact on factor-analytic solutions that emerge using the instrument (Shedler & Westen, 2004).

**Clinical Data Form for Adolescents (CDF-A).** The CDF (which has adult and adolescent versions, the CDF and CDF-A) is a clinician-report form developed over several years that assesses a range of variables relevant to demographics, axis I diagnosis, and etiology (Westen & Shedler, 1999a). Clinicians first provide demographic data on themselves and the patient. They then rate the patient's adaptive functioning using a number of indices, such as ratings of school performance and peer relations, as well as relatively objective indicators such as history of arrests, suicide attempts, and psychiatric hospitalizations. Research has demonstrated that clinician ratings of

adaptive functioning variables show high interrater reliability and validity (e.g., correlations with the same data obtained by independent interview  $r > .60$ ) (Hilsenroth et al., 2000; Peart & Westen, 2006; Westen, Muderrisoglu, Fowler, Shedler, & Koren, 1997).

The next section of the CDF assesses aspects of the patient's developmental and family history with which clinicians who have met with adolescents and/or their parents over several sessions are likely to be familiar. It assesses a range of variables of potential etiological relevance, such as history of foster care, family stability, and physical and sexual abuse. Clinicians working with adolescent patients generally have relatively direct access to such information, from having met with parents and/or other collateral sources.

In prior studies with both adolescent and adult samples, clinicians' judgments on these variables have predicted theoretically relevant criterion variables and have reflected reasonable and conservative decision rules (e.g., Dutra et al., 2004; Nakash-Eisikovits, Dutra, & Westen, 2002). For example, when asked to indicate reasons for their belief that a patient had a history of sexual abuse, virtually all clinicians checked off items indicating involvement of authorities such as police or Department of Social Services, intact pre-treatment memories of sexual abuse, and corroboration from family members or court records. Less than 5 percent indicated that their judgment reflected inferences from the symptom picture or memories recovered in treatment, and clinicians tended to rate cases with questionable or ambiguous reasons for inference as "unsure" (Russ, Heim, & Westen, 2003; Wilkinson-Ryan & Westen, 2000). CDF ratings of quality of patients' relationships with their parents also correlate strongly with scores on a clinician-report Parental Bonding Inventory (PBI; Parker, Tupling, & Brown, 1979; Russ et al., 2003), which has similar factor structure and correlates to the self-report version.

**Axis II checklist.** To generate both categorical and dimensional DSM-IV personality disorder diagnoses, we presented clinicians with a randomly ordered checklist of the criteria for all axis II disorders. In prior studies, this method has produced results that mirror findings based on structured interviews such as the SCID-II (Blais & Norman, 1997; Morey, 1988; Westen et al., 2003). Because we wanted to collect data useful for subsequent structural equation modeling and taxometric analyses, we obtained both present/absent and severity ratings on each symptom using a procedure similar to that used in the ADIS interview for anxiety disorders (Brown, DiNardo, & Barlow, 1994). Clinicians rated each symptom on a 6-point scale, anchored by the poles *absent* and *strongly present or severe*, with the following additional instruction:

Use ratings of 1 through 3 if you would judge the symptom "*absent*" if forced to make a present/absent judgment. Use ratings of 4 or higher if you would judge the symptom "*present*" if forced to make a present/absent judgment (i.e., the patient *has* the symptom).

To create categorical diagnoses, we then applied DSM-IV decision rules to the present/absent data. To generate DSM-IV dimensional diagnoses that mirror those widely used in the personality disorder literature, we summed the number of criteria judged present for each disorder.

### **Statistical analyses**

To identify possible personality subtypes of PD, we used Q-factor analysis, a technique that has been used effectively in a range of research on normal personality and psychopathology (Block, 1978; Caspi, 1998; Westen & Shedler, 1999b; Westen et al., 2003). Q-factor analysis differs from conventional factor analysis because it aggregates patients rather than variables, making it possible

to identify people with similar profiles across a set of items. The goal of Q-factor analysis in the present study was to identify groups of PD patients that shared personality characteristics and made them distinct from other individuals with PD. This method has a number of advantages over other cluster-analytic techniques. First, it does not require an assumption of mutually exclusive types, meaning that patients can match different subtypes that are identified to varying degrees. More importantly, it does not assume that subtypes exist, and therefore, can identify unidimensional as easily as multidimensional constructs (Block, 1978).

We followed standard factor-analytic procedures, first entering the data into a principal components analysis, specifying eigenvalues  $\geq 1$  (Kaiser's criteria), and using the scree plot, percent of variance accounted for, and parallel analysis (Horn, 1965; O'Connor, 2000) to determine the number of Q-factors to rotate. These procedures suggested a 3- to 6-factor solution. We applied multiple estimation procedures with 4 through 6 factors to increase the likelihood of identifying robust and coherent factors. Once we established an optimal solution, we created dimensional and categorical scores for each patient as follows. We used Q-correlations to create dimensional scores, which reflect the correlation or "match" between each patient's 200-item profile and the empirically generated 200-item Q-factor profiles (see Block, 1978). For categorical subtype diagnoses, we assigned patients to the group for which they had the highest Q-correlation, similar to a factor loading, using a correlation  $\geq .25$  as a cutoff (selecting the highest correlation to assign categorical scores if the patient had "loadings"  $\geq .25$  on more than one Q-factor).

Next, we tested the validity of the subtypes by examining their external correlates. Where appropriate, we tested hypotheses using contrast analysis, which maximizes power and minimizes the likelihood of spurious findings resulting from running multiple analyses, by testing specific, one-tailed questions (i.e., about the relative ordering of group means) rather than global questions that are usually of less theoretical interest (e.g., whether the three groups just differed in some unspecified way) (Rosenthal, Rosnow, & Rubin, 1999). Prior to examining correlations between the Q-scores and external correlations, we generated a priori hypotheses (expressed as contrast weights) based on examination of the item content of the subtypes and previous research. To maximize the reliability of external correlates, we aggregated ratings where possible to create composite variables related to adaptive functioning and developmental history (e.g., aggregating multiple types of childhood adversity, such as abuse and separations), first standardizing where appropriate.

Finally, to assess the incremental validity of the three personality subtypes over and above DSM-IV axis I diagnoses (i.e., MDD, GAD, PTSD, Social Phobia), we used hierarchical linear regression to examine the extent to which personality subtypes could predict composite variables reflecting adaptive functioning after first holding constant the DSM-IV axis I diagnoses.

## Results

Patients ( $N = 57$ ) were 57.9 percent female, with a mean age of 15.81 (s.d. 1.83) and mean GAF of 56.18 (s.d. 11.15). The sample was 82.5 percent Caucasian, with 5.3 percent African-American and 7.0 percent Hispanic; primarily middle class (47.4%), with a range from poor (3.5%) to upper class (7.0%); and primarily seen in private practice (80.7%) or clinic (14.0%) settings (although 5.4% were seen in school, hospital inpatient or residential settings). The clinician sample consisted of 71.4 percent psychologists, of whom 57.6 percent were male. The majority were highly experienced ( $m = 18.5$  years, s.d. 8.63). Most clinicians reported an eclectic or integrative theoretical orientation (52.3%), followed by CBT (20.6%) and psychodynamic (18.8%). Median length of treatment was 11 months, so clinicians knew the patients well.

The most common comorbid axis I diagnoses associated with PD patients were GAD (53.4%), Dysthymic Disorder (50.0%), MDD (36.2%), Adjustment Disorder (31.0%), Substance Use

**Table 1.** Adolescent sample characteristics

	(N = 57)
<i>Gender</i>	
Male	42.1
Female	57.9
<i>Race</i>	
Caucasian	82.5
African-American	5.3
Hispanic	7.0
Asian	3.5
Other	1.8
<i>SES</i>	
Poor	3.5
Working class	8.8
Middle class	47.4
Upper middle class	33.3
Upper class	7.0
Age: mean (SD)	15.81 (1.83)
<i>Axis I Comorbid Diagnoses</i>	
Generalized Anxiety Disorder	53.4
Dysthymic Disorder	50.0
Major Depressive Disorder	36.2
Substance Use Disorder	26.3
Adjustment Disorder	31.0
Social Phobia	25.9
Posttraumatic Stress Disorder	17.2

Note: Data are presented as percentage of patients unless otherwise specified.

Disorder (26.3%), and Social Phobia (25.9%). Table 1 presents patient demographics and clinical characteristics of the PD study sample.

### *Identifying personality subtypes*

Q-factor analysis identified three subtypes. We report here the principal axis factoring (PAF) solution with a 5-factor Varimax rotation, which accounted for 42.1 percent of the variance. For ease of interpretability, Table 2 shows the 18 items from the SWAP-II-A most characteristic of each subtype (Q-factor) (i.e., the items that, on average, received scores of 6 and 7 on the 0–7 distribution of the sort). The items are arranged in descending order based on factor scores (expressed in standard deviation units) that reflect the item's centrality to the construct. In Q-factor analysis, patients load on factors, and items receive factor scores indicative of the centrality of the item to the construct relative to the other items in the item set. We labeled the Q-factors *High Functioning/Dysphoric*, *Emotionally Dysregulated*, and *Avoidant*.

*High Functioning/Dysphoric* patients were characterized by items indicating guilt and anxiety, as well as difficulty expressing anger and a tendency toward passivity and dependence, which were embedded in an overall healthy personality structure. Patients classified as *Emotionally Dysregulated* demonstrated features often characteristic of Borderline Personality Disorder, including a tendency for emotions to spiral out of control and an inability to soothe themselves (Bradley & Westen, 2005). Characteristics also included impulsivity, hyperactivity and excessive anger. *Avoidant* patients were characterized by social avoidance, constriction, and a self-critical and despondent personality style.

**Table 2.** Empirically defined adolescent subtypes (Q-factors)

	Mean
<i>High Functioning/Dysphoric</i>	
Is capable of sustaining meaningful relationships characterized by genuine intimacy and caring	2.4567
Tends to feel anxious	2.3587
Tends to be liked by other people	2.3247
Tends to feel guilty (e.g., may blame self or feel responsible for bad things that happen)	2.3044
Has panic attacks (i.e., episodes of acute anxiety accompanied by strong physiological responses)	2.2549
Tends to be conscientious and responsible	2.2199
Is empathic; is sensitive and responsive to other peoples' needs and feelings	2.1006
Tends to be needy or dependent	1.9841
Tends to feel ashamed or embarrassed	1.9685
Tends to be shy or self-conscious in social situations	1.8501
Tends to be passive and unassertive	1.7743
Has moral and ethical standards and strives to live up to them	1.7522
Has a good sense of humor	1.6653
Has difficulty acknowledging or expressing anger	1.599
Tends to feel helpless, powerless, or at the mercy of forces outside his/her control (beyond what is warranted by the situation)	1.5639
Tends to ruminate; may dwell on problems, replay conversations in his/her mind, become preoccupied with thoughts about what could have been, etc.	1.5539
Tends to develop somatic symptoms in response to stress or conflict (e.g., headache, backache, abdominal pain, asthma, etc.).	1.5179
Is troubled by recurrent obsessional thoughts that s/he experiences as intrusive.	1.4695
<i>Emotionally Dysregulated</i>	
Tends to become irrational when strong emotions are stirred up; may show a significant decline from customary level of functioning	2.809
Emotions tend to spiral out of control, leading to extremes of anxiety, sadness, rage, etc.	2.7073
Is prone to intense anger, out of proportion to the situation at hand (e.g., has rage episodes)	2.6487
Tends to be angry or hostile (whether consciously or unconsciously)	2.3329
Is unable to soothe or comfort him/herself without the help of another person (i.e., has difficulty regulating own emotions)	2.1647
Tends to be unreliable and irresponsible (e.g., may fail to meet school or work obligations)	2.1204
Tends to give up quickly when frustrated or challenged	2.0831
Tends to feel anxious	1.8779
Tends to act impulsively (e.g., acts without forethought or concern for consequences)	1.8626
Attempts to avoid feeling helpless or depressed by becoming angry instead	1.8176
Emotions tend to change rapidly and unpredictably	1.7612
Tends to feel unhappy, depressed, or despondent	1.747
Has difficulty maintaining attention and focus on tasks; is easily distracted by sights, sounds, unrelated thoughts, or other competing stimuli	1.7301
Has panic attacks (i.e., episodes of acute anxiety accompanied by strong physiological responses)	1.7243
When distressed, tends to revert to earlier, less mature ways of coping (e.g., clinging, whining, having tantrums)	1.6668
Appears to fear being alone; may go to great lengths to avoid being alone	1.6494
Is rebellious or defiant toward authority figures; tends to be oppositional, contrary, quick to disagree, etc.	1.5881
Has trouble sitting still; is restless, fidgety, or hyperactive.	1.5616



**Table 2.** (Continued)

	Mean
<i>Avoidant</i>	
Lacks close friendships and relationships	2.8782
Lacks social skills; tends to be socially awkward or inappropriate	2.743
Tends to feel like an outcast or outsider	2.4685
Tends to avoid, or try to avoid, social situations because of fear of embarrassment or humiliation	2.3582
Tends to be shy or self-conscious in social situations	2.1228
Tends to be passive and unassertive	2.0145
Tends to be inhibited or constricted; has difficulty allowing self to acknowledge or express wishes and impulses	1.9068
Tends to feel ashamed or embarrassed	1.7437
Tends to feel unhappy, depressed, or despondent	1.7389
Decisions and actions are unduly influenced by efforts to avoid perceived dangers; is more concerned with avoiding harm than pursuing desires	1.7298
Tends to fear s/he will be rejected or abandoned	1.718
Tends to feel s/he is inadequate, inferior, or a failure	1.7106
Appears to find little or no pleasure, satisfaction, or enjoyment in life's activities	1.7103
Tends to be ignored, neglected, or avoided by peers	1.6854
Is self-critical; sets unrealistically high standards for self and is intolerant of own human defects	1.6607
Is suspicious; tends to assume others will harm, deceive, conspire against, or betray him/her	1.6446
Tends to feel listless, fatigued, or lacking in energy	1.6425
Tends to "catastrophize"; is prone to see problems as disastrous, unsolvable, etc.	1.3323

### *Validity analyses*

We examined the validity of the classification using four sets of criterion variables: diagnostic (axis I and II) variables, adaptive functioning measures, and variables of potential etiologic significance.

***Axis I and axis II pathology.*** Table 3 presents axis I and axis II pathology in relation to PD subtypes. Because we wanted to test specific hypotheses, we used contrast analyses and report in the table both the hypotheses (with contrast weights) and our findings. Where Levene's test of inequality of group variances was significant, we tested contrasts using *t*-tests for unequal variances (identifiable in the table by the low degrees of freedom).

In examining axis I and axis II pathology, as predicted, the Emotionally Dysregulated group had the highest rates of Borderline Personality Disorder and the Avoidant group had the highest rate of Avoidant Personality Disorder. Our predictions regarding rates of PTSD and Major Depression were not supported. Emotionally Dysregulated PD patients had the highest rates of PTSD and Major Depression, although clear differences between the three groups were not statistically significant.

***Adaptive functioning and etiology.*** Table 4 presents subtype differences on composite measures of adaptive functioning and etiology. As predicted, the High Functioning/Dysphoric group was significantly healthier in terms of global functioning, while the Emotionally Dysregulated group was significantly more impaired in terms of both global and school functioning. Also as expected, the Emotionally Dysregulated group scored significantly higher on psychiatric impairment than the other subtypes.

**Table 3.** Axis I and axis II pathology by adolescent personality subtype (percent meeting DSM-IV criteria)

	High Functioning/ Dysphoric N = 18 M (SD)	Dysregulated N = 12 M (SD)	Avoidant N = 12 M (SD)	Hypotheses	t(df)	Sig.	r
Borderline Personality Disorder	.11(.32)	.50(.52)	.08(.29)	-2 3 -1 D > A > H	2.47(14)	.03*	.55
Avoidant Personality Disorder	.56(.51)	.50(.52)	.83(.39)	-2 -1 3 A > H > D	2.02(27)	.05*	.36
Posttraumatic Stress Disorder	.11(.32)	.25(.45)	.08(.29)	-3 2 1 D > A > H	.73(39)	.47	.12
Major Depressive Disorder	.33(.49)	.50(.52)	.33(.49)	-2 1 1 D,A > H	.54(39)	.59	.09

\*Indicates scores are significantly higher at  $p \leq .05$ .

\*\*Indicates scores are significantly higher at  $p \leq .01$ .

**Table 4.** Relation between adolescent personality subtypes and adaptive functioning and etiologic variables

	High Functioning/ Dysphoric N = 18 M (SD)	Dysregulated N = 12 M (SD)	Avoidant N = 12 M (SD)	Hypotheses	t(df)	Sig.	r
<i>Adaptive Functioning (SD units)</i>							
Global adaptive functioning	.49(.46)	-.42(.66)	-.19(.53)	-3 2 1 D > A > H	-4.85(39)	< .001**	.61
Global psychiatric functioning	-.02(.87)	1.2(.72)	-.18(.88)	-3 2 1 D > A > H	2.89(39)	.006**	.42
Global school functioning	.70(.78)	-.37(.86)	-.09(.92)	-3 2 1 D > A > H	-3.61(39)	.001**	.50
<i>Developmental variables (SD units)</i>							
Childhood family environment	.41(.46)	-.12(.70)	.29(.68)	3 -2 -1 D > A > H	2.05(39)	.048*	.31
Adverse childhood environment	3.39(.78)	4.17(1.99)	3.17(.94)	-2 3 -1 D > A > H	1.43(13)	.18	.37
Childhood trauma	-.39(.31)	.08(.72)	-.27(.51)	-2 3 -1 D > A > H	2.44(39)	.019*	.36
Childhood attachment disruption	-.27(.27)	.02(.56)	-.35(.30)	-2 3 -1 D > A > H	2.36(39)	.02*	.35
<i>Family history (1<sup>st</sup> degree relative)</i>							
Substance abuse	.04(.11)	.25(.25)	.00(.00)	-3 2 -1 D > A > H	2.00(39)	.05*	.30

\*Indicates scores are significantly higher at  $p \leq .05$ .

\*\*Indicates scores are significantly higher at  $p \leq .01$ .

Note: Aggregated variables comprised of the following standardized scores:

*Global adaptive functioning*: job losses, social support, quality of romantic relationships, quality of general relationships, employment history, and a 5-point rating of personality health-sickness; *Global psychiatric functioning*: GAF score, hospitalizations and suicide attempts; *Global school functioning*: school performance and school functioning; *Childhood family environment*: family warmth and family stability; *Adverse childhood environment*: relationship with mother, relationship with father, pathology of mother, pathology of father and moves; *Childhood trauma*: history of physical and sexual abuse; *Childhood attachment disruption*: significant separations, foster care, sent to live elsewhere, and living with an alcoholic in the house; *Substance abuse*: alcohol abuse, pill abuse, illicit drug abuse.

Table 4 also includes data on developmental and family history. As expected, the Emotionally Dysregulated group experienced high levels of childhood trauma and attachment disruption, indicative of an overall unstable family environment. Also, as hypothesized, the High Functioning/Dysphoric group showed a significantly more stable family environment and less childhood trauma than the other subtypes. The Avoidant group showed the least adverse childhood events. In addition, the Emotionally Dysregulated group had the highest rate of substance abuse among first degree relatives.

### *Incremental validity of PD personality subtypes*

We next examined the incremental validity of dimensional personality subtype scores in predicting criterion variables, holding constant DSM-IV axis I disorder diagnoses commonly comorbid with PD and associated with poorer functioning in prior research (i.e., MDD, GAD, PTSD, and Social Phobia), a conservative test of validity. To assess whether personality style predicted variance above and beyond DSM-IV axis I disorders (i.e., MDD, GAD, PTSD, and Social Phobia) we used a composite measure of adaptive functioning as the criterion variable, which captured global functioning, school functioning, and relationship functioning.

As shown in Table 5, axis I comorbidity was not predictive of adaptive functioning in Step 1. Adding the personality dimensions in Step 2 significantly improved the predictive validity. Examination of the standardized betas showed that all three of the subtypes were predictive of adaptive functioning, holding the others (along with all axis I disorders included at step 1) constant. The High Functioning/Dysphoric dimensional score predicted positive adaptive functioning, whereas Dysregulation and Avoidant scores predicted low adaptive functioning.

## Discussion

This exploratory study identified three types of adolescents with PD – *High Functioning/Dysphoric*, *Emotionally Dysregulated*, and *Avoidant*. What is striking is that these were also the

**Table 5.** Hierarchical linear regression predicting global adaptive functioning from DSM-IV axis I diagnoses (Step 1) and adolescent personality subtypes (Step 2)

Predicting global adaptive functioning (N = 58)	Stand.β	T	p	R	R <sup>2</sup>	F change	P change
Step 1: DSM-IV axis I diagnoses				.17	.03	.37	.83
Step 2: DSM-IV axis I diagnoses and personality subtypes				.75	.53	20.24	< .001**
Step 1							
Social Phobia	-.16	-1.08	.29				
GAD	.06	.38	.71				
PTSD	-.02	-.16	.88				
MDD	-.07	-.50	.62				
Step 2							
Social Phobia	-.04	-.37	.71				
GAD	-.17	-1.57	.12				
PTSD	.08	.84	.40				
MDD	.03	.33	.74				
High Functioning/Dysphoric	.41	3.89	< .001**				
Emotionally Dysregulated	-.55	-5.43	< .001**				
Avoidant	-.29	-2.75	.008**				

\*Indicates scores are significantly higher at  $p \leq .05$ .

\*\* Indicates scores are significantly higher at  $p \leq .01$ .

first three factors in our study of adult panic patients (Powers & Westen, 2009), suggesting that these personality subtypes are not only replicable but begin by adolescence. Contrast analyses provided initial data for the validity of these taxonomic distinctions. Subtype dimensional scores showed substantial incremental prediction of adaptive functioning, a key clinical variable that captures how well teenagers are doing in school and social relationships, even holding constant common forms of axis I comorbidity that are often associated with poor functioning.

### Limitations

The study has three primary limitations. First, it was a small-N study which used clinician diagnosis of PD to include patients in the analysis. Clearly administration of structured interviews would be essential in the next study. Several factors, however, mitigate against this limitation. First, we asked clinicians to make diagnoses conservatively, that is, not to diagnose a disorder unless they were *certain* the patient met DSM-IV criteria for the disorder. Thus, although we likely had false negatives not included in the study, it is unlikely that we had many false positives. Second, panic symptoms severe enough for a clinician to diagnose PD in adolescents are not subtle. It is thus possible that the study included some patients who may not technically meet DSM-IV criteria for number of disorders per week and duration of symptoms but highly unlikely that they diagnosed this disorder in patients without recurrent panic attacks. Third, and perhaps most importantly, data from our lab have demonstrated that not only do clinicians' diagnoses of various axis I disorders correlate with both DSM-IV diagnoses and particularly strongly with dimensional (prototype) ratings of the disorder, but that they show as high or higher correlations with self-reported symptoms than formal DSM-IV diagnoses (see Westen & Shedler, 2007).

The second limitation was that we obtained information about each patient from a single informant, the treating clinician, creating the potential for rater bias. The fact that we were able to produce subtypes of PD for our sample highly similar to those found in a completely unrelated sample with adults and that both sets of subtypes were unfamiliar to the clinicians does, however, mitigate the extent to which clinician bias may have influenced our results. In addition, the patients included were part of a study of adolescent personality pathology; clinicians were not likely thinking about the panic diagnosis as they described these patients, as they were making over 1000 discriminations across multiple measures and gave them multiple other axis I and axis II diagnoses. Finally, recent research from our lab shows very high correlations (on the order of  $r = .50$  to  $.70$ ) between aggregated criterion variables assessing adaptive functioning, childhood history, and family history used in this study and patient self-reports of the same variables, suggesting that clinician ratings are a strong proxy for patient self-reports of the same variables, which are the norm in this kind of research (DeFife & Westen, 2010). Future research should attempt to replicate and extend these findings using samples of panic patients studied by interview, where one interviewer assesses personality and the patient and other interviewers assess axis I symptoms, adaptive functioning, and other criterion variables such as molecular genetics that might differentiate the subgroups. We are current midway through a study of that sort with adult patients.

Finally, this was a preliminary study. We do not know the developmental trajectories of adolescent PD patients, which can only be assessed by longitudinal research. However, the strong resemblance between the three subtypes identified here and the first three of four subtypes identified independently in an adult sample suggests substantial continuity. Whether a fourth (hypochondriacal) subtype would have emerged if we had a higher number of PD patients in this sample, as in the adult sample, is unknown; it is equally possible that a more purely hypochondriacal subtype does not emerge until adulthood.

### *Clinical implications*

The findings from this study provide further preliminary support for the importance of personality subtyping in understanding heterogeneity within a given disorder. As this study has demonstrated, personality subtyping captures meaningful patterns of variation that diagnoses based solely on differences among the symptoms of the disorder itself cannot. Within the sample, global adaptive functioning was better predicted once adolescent subtypes were established. The ability to predict functioning based on personality subtypes could enable clinicians to better predict treatment outcome.

In adult patients with PD, Powers and Westen (2009) found that High Functioning patients benefited substantially from psychotherapy (including primarily eclectic/integrative psychotherapy, CBT or psychodynamic therapy), whereas Dysregulated patients showed much poorer response, suggesting the need to study other types of interventions to see what might work for these individuals, either in lieu of or in addition to standard treatments for PD. In preliminary analyses, we recontacted clinicians one year after initially completing the data for this sample and asked them to rate the effectiveness of the treatment to date, particularly psychotherapy (in which all patients in this study were reported to be in), but also antidepressants and anxiolytics. Although the numbers were too small to draw definitive conclusions (roughly two-thirds of clinicians responded to our request for follow-up data, providing data on 36 of the 57 patients reported on here), the correlations between psychotherapy effectiveness and the three subtypes assessed dimensionally (i.e., the extent to which the patient matched each prototype) were approximately  $r = .30$  for both high functioning and avoidant patients and  $r = -.30$  for emotionally dysregulated patients, directly matching what we found in adults. Although data on response to medication was less reliable because of the small numbers, in all cases the more dysregulated the patient, the poorer the response to both antidepressants and anxiolytics.

Brief, panic-focused treatments may be particularly appropriate for high-functioning PD patients, for whom this is the major concern, and may prove useful for treating panic in avoidant patients, but may prove insufficient for dysregulated adolescents and may not address the personality pathology in any of the subgroups (whether or not that pathology meets formal DSM-IV criteria for a personality disorder). Having a more personality-based treatment may be more useful for many of these other patients. This may be why personality-focused treatments have recently shown surprising efficacy in PD patients, even in brief treatments, comparable to that of CBT (e.g., Milrod et al., 2007). An emphasis on personality within treatment of PD may produce positive results for patients unresponsive to primarily symptom-based treatment methods.

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