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## Prevalence of Personality Disorders using two diagnostic systems in psychiatric outpatients in Shanghai, China: A comparison of uni-axial and multi-axial formulation

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### Abstract

**Objective**—To compare multi-axial (DSM-IV) with uni-axial diagnostic system (CCMD-3, Chinese Classification and Diagnostic Criteria of Mental Disorders) as diagnostic methods to determine the prevalence of personality disorders (PDs) in Chinese psychiatric outpatients.

**Method**—3,075 outpatients were randomly sampled from clinical settings in China. CCMD-3 PDs were evaluated as per routine psychiatric practice. DSM-IV PDs were assessed using both self-reported questionnaire and structured clinical interview.

**Results**—The prevalence estimate for any type of PD in the total sample is 31.93% as reflected in the DSM-IV. This figure is nearly 110 times as large as the prevalence estimate for the CCMD-3. Only 9 outpatients were diagnosed with PD based on the CCMD-3. Amongst the 10 forms of DSM-IV PDs, avoidant (8.1%), obsessive-compulsive (7.6%), paranoid (6.0%), and borderline (5.8%) PDs were the most prevalent sub-types. This study found that PDs are commonly associated with the following: (i) the younger aged; (ii) single marital status; (iii) those who were not raised by their parents; (iv) introverted personalities; (v) first-time seekers of psycho-counseling treatment; and (vi) patients with co-morbid mood or anxiety disorders.

**Conclusions**—PDs are easily overlooked when the diagnosis is made based on the CCMD-3 uni-axial diagnostic system. However it was found that personality pathology is common in the Chinese psychiatric community when using the DSM-IV classification system. Existing evidence suggest, at least indirectly, that there are important benefits of moving towards a multi-axial diagnostic approach in psychiatric practice.

### Keywords

Personality disorder; Prevalence; Diagnosis; Outpatients; China

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Declaration of interests

None.

## Introduction

Personality disorders (PDs) have not been given sufficient attention from psychiatric professionals in China as compared to other serious mental illnesses such as schizophrenia and major depression. As a result few studies have tried to estimate the frequency of PDs in Chinese psychiatric patients. PDs are seldom considered as either potential aetiological factors for psychotic symptoms, or the co-occurrence for other mental disorders. Instead they are perceived as immeasurable, untreatable, or meaningless diagnoses by Chinese clinicians.

The differences in PD prevalence rates are mainly attributed to the uni-axial classification system used in CCMD. The CCMD appears to have given little thought to issues of co-occurring PDs and other mental disorders. Table 1 presents an overview of the prevalence rates of PD in the general population in both US and China during the 1990s. Although there is insufficient data on PD prevalence rates of China's clinical population in the past decade, Western data suggest a high (Newton-Howes et al. 2009) and broad range (10.8% – 73.7%) (Zimmerman et al. 2005) of clinical prevalence rates exist. There is an enormous difference in PD assessment and identification according to each diagnostic manual.

Since the DSM-III multi-axial diagnostic system was put forth in 1980, theoretical grounds for co-morbidity diagnosis of PDs were established. Great advances have been made to both research and clinical practice. It is well-established that PD has a close association with the course and outcome of Axis I disorders (Dunayevich et al. 2000; Yonkers et al. 2000; Grilo et al. 2005) and is also related with functional impairments (Seivewright et al. 2004; Skodol et al. 2005; Skodol et al. 2010), treatment response and utilization (Bender et al. 2001). Given the evidence, there is paucity of knowledge about the application of PD diagnoses in routine psychiatric practice in China, but none of the prior studies have used two different diagnostic systems to compare PD prevalence rates. Therefore, it remains unclear whether DSM-IV Axis II diagnoses of PDs are common amongst psychiatric outpatients in Chinese populations.

In light of this, we carried out a large-scale survey in the psycho-counseling and psychiatric clinics to examine a representative sample of a broad range of pathologies in Shanghai Mental Health Center between May - October 2006. The primary aim of this paper is to report prevalence rates of PDs in psychiatric outpatients in Shanghai, using both DSM-IV (multi-axial) and the Chinese CCMD-3 (uni-axial), with the larger goal of determining the potential of implementing multi-axial diagnoses in China.

## Methods

### Subjects

We recruited outpatients from the largest psycho-counseling and psychiatric clinics in Shanghai, China. 3,402 subjects were randomly selected based on the order of registration at the outpatient unit. Inclusion criteria were as follows: (i) 18 to 60 years old; (ii) individuals with the capacity to provide informed consent; and (iii) an educational background of at least junior middle school. Patients with severe somatic diseases, acute attacks of psychoses,

and diagnoses of mental retardation or dementia were excluded. Thus, 327 (9.6%) subjects were excluded from the study. Consequently, the remaining 3075 subjects seeking medical treatment were recruited between May and October 2006. Amongst them were 1,673 subjects (54.4%) from the psychiatric clinic, and 1,402 subjects (45.6%) from the psycho-counseling clinic. There were 1,354 males (44.0%) and 1,721 females (56.0%). The average age was 32.0 years (SD =10.2); 31.2 years (SD =10.1) for males, and 32.7 years (SD =10.3) for females. 1294 participants (42.1%) were married, 1376 (44.7%) completed college, and 1268 (41.2%) participants have a monthly income of less than 1000 Yuan.

### Assessment tools and Diagnostic Criteria

The Personality Diagnostic Questionnaire (PDQ-4+) is a self-report questionnaire which includes 107 items and was mainly designed to assess all 10 PDs included in the DSM-IV. Each PD criterion is assessed by 1 item. Two or more examples must be cited before it could be assessed as 1 item to meet the criterion for *impulsivity* in Borderline PD. Similarly, three or more examples before the age of 15 years must be specified to satisfy the criteria for conduct disorder, and meet the diagnosis of Antisocial PD. The PDQ-4+ was previously tested for reliability and validity in the Chinese population. Reliability values fell within the 0.5 – 0.8 range. There was relatively high sensitivity (0.89) and medium specificity (0.65), while test-retest reliability was reported to be 92.2% (Yang et al. 2000; Yang et al. 2002b). PDQ-4+ has been widely used to screen for DSM-IV PD in Chinese psychiatric patients and other populations including college students and criminals (Yang et al. 2002a; Huang et al. 2007; Zhang et al. 2009).

The Structured Clinical Interview for DSM-IV AxisII (SCID-II) was designed to measure all 10 PDs in DSM-IV, including negativistic PD and depressive PD which are included in the Appendix of DSM-IV. The English version of SCID-II was translated and revised by the seventh author (HY, Zhang) under the supervision of the corresponding author (ZP, Xiao). The reliability and validity of the Chinese version was later conducted by the fifth author (YF, Dai; who published the related data and guidelines for using SCID-II in China (Dai and Xiao 2006; Dai et al. 2006). The median internal consistency coefficient was reported to be 0.70. The median Kappa value yielded 0.70, which reflected the test-retest reliability, and 0.86 for the inter-rater reliability. Overall, there was 90.7% consistency between both versions of clinical diagnoses of PD.

Both instruments described above had a corresponding relationship with the criteria of DSM-IV PD diagnoses. On the other hand, the CCMD-3 PDs were also assessed by the attending psychiatrist based on clinical routine practice. The CCMD-3 PDs consist of paranoid, schizoid, dissociative, impulsive, histrionic, anankastic, anxious, dependent, and unspecified subtypes. The other categories of mental disorders in CCMD-3 were defined partly based on the DSM-IV, and most of the diagnoses such as schizophrenia, bipolar disorder, depression, panic disorder, generalized anxiety disorder, obsession are identical or similar to international classifications.

## Procedures

Upon receiving ethics approval from the Research Ethics Committee in Shanghai Mental Health Centre in 2006, a random sample was obtained from the psycho-counseling and psychiatric clinics. More than 200,000 outpatients visit these clinics annually. Systematic sampling was performed in the outpatient unit. Two staff members issued information sheets to the 10<sup>th</sup> individual in the psycho-counseling clinic and the 20<sup>th</sup> person in the psychiatric clinic according to the registration order. After obtaining the patients' informed consent, they were directed to complete the self-report questionnaires (PDQ-4+). Subsequently, the trained nurses entered the data into the computer and checked to ensure that each questionnaire was complete. Participants whose PDQ-4+ test result was positive were then referred for the SCID-II clinical interviews.

The interviewers included two senior psychiatrists who were trained for a fortnight by the research team members (ZP, Xiao; YF, Dai et al.). After training, two raters independently scored all 30 inpatient interviews to determine inter-rater reliability. The Kappa value of reliability for any PD was 0.82. There were insufficient inpatients diagnosed with individual PD to calculate kappa value for individual PD.

In order to reduce the effect that subjective deviation had on the results of the SCID-II clinical interview, the interviewers were not aware of the PDQ-4+ test results and clinical diagnoses of the patients. The clinical diagnoses of all participants were made by their attending doctors who were ignorant to the results of the personality evaluation. All the clinicians in the psycho-counseling and psychiatric clinics were notified that there was an investigation on DSM-IV PDs in these outpatients, but they were only asked to diagnose mental disorders based on the routine clinical practice using the CCMD-3. The clinical diagnoses of participants reported in this paper were mainly classified according to outpatients' medical records.

## Statistical Analysis

The SPSS version 16.0 (SPSS Inc., USA) was used for analyses. The inter-rater reliability was performed by chi-square test. The rates of PDs diagnosis in each diagnostic manual, and 95% confidence intervals (CI) were calculated using categorical variables. The concordance between the results of the self-reporting and structured interview PD test was determined by calculating the kappa values. Generally, kappa values of <0, 0 to 0.2, 0.21 to 0.4, 0.41 to 0.6, 0.61 to 0.8, 0.81 to 0.99, 1.0 indicate poor, slight, fair, moderate, substantial, almost perfect, and perfect agreement, respectively.

Logistic regression analysis with the forward stepwise method was performed to assign a predicted probability of the outpatients who were diagnosed DSM-IV PD. Evaluated independent variables included age; sex; marital status (married/single); educational level (junior middle school/senior high school graduate or above); monthly income (>/ 3000 Yuan); childhood caregiver (parents/others); temperament (introversion/extroversion); psycho-counseling/psychiatric clinics; first visit/subsequent visit; presence of psychosis (including schizophrenia, schizoaffective psychosis); presence of mood disorders (including bipolar disorder, depression and dysthymia); and presence of anxiety disorders (including

phobia, panic disorder, generalized anxiety disorder, obsessive-compulsive disorder). Odds ratio (OR), 95% CI, chi statistic and *P* value for all individual variables in the final model were estimated. All statistical differences were considered significant at  $P < .05$ .

## Results

### Clinical characteristics of participants

Of the total sample of 3,075 outpatients presenting for medical treatment in the psycho-counseling clinic and psychiatric clinics, 594 subjects (19.3%) were on first clinic visits; 1524 subjects (49.6%) have had the disorder for more than one year. According to their medical records, 850 outpatients (27.6%) had been diagnosed with schizophrenia; 641 (20.8%) had been diagnosed with major depressive disorder, 286 outpatients with panic disorder or generalized anxiety disorder (9.3%), 153 outpatients with obsessive-compulsive disorder (5.0%), 101 with bipolar disorder (3.3%), 78 with phobia (2.5%), and 481 subjects (15.6%) with an unspecific diagnosis.

### Frequency of CCMD-3 PDs in routine clinical use

The frequency of CCMD-3 PD in the total sample was 0.3% (9 patients, 95% CI 0.1%-0.5%), and only two patients were subsequently classified according to the CCMD-3 PD classifications (Paranoid PD and Anankastic PD). Of those 9 patients, 5 were females and 4 were males; the mean age was 25.3 years ( $SD=7.4$ ); 8 were single and 1 was divorced. Additionally, 22 subjects in our sample were considered to have personality defect or pathological personality traits according to their medical records but with no formal clinical PD diagnosis. None of the PD diagnoses were dually diagnosed with other mental disorders.

### Frequency of DSM-IV PDs using self-report measures (PDQ-4+)

Assessed by the PDQ-4+, 83.6% of outpatients met the criteria for at least one specific PD. The data in Table 2 indicate that the most frequently diagnosed personality subtype was cluster C, which represented slightly less than three-quarters of the entire sample. The most common PD according to the PDQ-4+ was obsessive-compulsive PD (54.8%), followed by avoidant PD (54.2%). The less frequently self-reported PDs were: Schizoid PD (21.6%) and Antisocial PD (22.5%). Self-report of 10 main specific PDs based on PDQ-4+ had relatively high sensitivity (63.41%-89.16%), and moderate specificity (47.43%-79.59%), whereas the concordance between both examinations of PDs was poor (a mean kappa of 0.08).

### Frequency of DSM-IV PD using semi-structured clinical interview (SCID-II)

Nearly one-third of the outpatients met a diagnosis of at least one PD according to the SCID-II clinical interview. The DSM-IV PD (which includes only 10 PDs as stated in the DSM-IV) had approximately 110 times greater prevalence than CCMD-3 PD. Among those 3075 outpatients, the most prevalent PD was avoidant PD (8.1%), followed by obsessive-compulsive PD (7.6%), paranoid PD (6.0%), while antisocial PD (0.6%) was significantly less common. Other less common PDs include: histrionic, narcissistic, schizoid, and schizotypal PD (2.3%-2.8%).

### DSM-IV PD comorbidity with CCMD-3 Axis I diagnoses

These high prevalence rates of PD imply that large proportions of people with Axis I disorders also meet criteria for DSM-IV PDs. This is especially true for mood disorders (42.18%). With regard to outpatients with schizophrenia, nearly one-fourth of cases also meet criteria for at least one DSM-IV PD, with the most prevalent PD was paranoid PD (7.65%), followed by avoidant PD (7.53%). With regard to mood disorders, 11.5% of cases meet criteria for borderline PD. The proportions of anxiety disorders with co-morbid Obsessive-compulsive PD (13.35%) and avoidant PD (10.06%) are much higher than other PDs. (For details see Table 4)

### Proportion of Patients with Comorbid PDs

All 982 patients with PDs corresponding to DSM-IV Diagnostic Criteria were examined, amongst whom were 436 patients with two or more PDs, making up 47.1% of the PD patients and 14.2% of the total sample (Table 5).

### Risk Factors Associated With the Diagnoses of DSM-IV PD

To help identify which risk factors were related to PD diagnoses, logistic regression (forward stepwise) analyses were performed. The presence of PD was listed as the dependent variable, while demographic and clinical characteristics were listed as independent variables. Among the demographic factors, the younger aged, single marital statuses, individuals who were not raised by their parents, and introverted personalities were associated with the presence of PD. Among the clinical factors, first visits, those seeking for psycho-counseling treatments, and patients with mood disorders (including mania, bipolar disorder, depression and dysthymia), and anxiety disorders (including phobia, panic disorder, generalized anxiety disorder, obsessive-compulsive disorder) were significant predictors of meeting criteria for DSM-IV PD diagnoses. The strongest effect derived from mood disorder patients (Table 6).

## Discussion

It is likely to be inaccurate to compare prevalence rates using different diagnostic systems. The non-suitability stems from the differences in measuring for specific PD across both manuals. However, due to the potential negative impacts caused to these PD patients, it is imperative the Chinese psychiatrists understand the tremendous heterogeneity in the existing rates of the disorder. It is helpful to start with a discussion of the prevalence rates of PD patients seeking for mental health services in China. The current study suggests that the CCMD-3 tends to neglect the PD diagnosis because few clinicians will consider the possibility of diagnosing a patient with PD. This is especially true when the patient exhibits clear symptoms of an Axis I psychiatric disorder.

On the contrary, we found that DSM-IV PDs were common in Chinese psychiatric outpatients. The finding that about one-third of outpatients suffer from at least a diagnosable PD appears to be consistent with the rates found in western countries (Vieta et al. 1999; Denys et al. 2004; Newton-Howes et al. 2009). (Zimmerman et al. 2005) conducted the structured interview for DSM-IV PD with 270 psychiatric outpatients. They found that



31.4% met criteria for at least one DSM-IV PD (excluding depressive PD, passive-aggressive PD, and PD not otherwise specified). The prevalence rate increased to 45.5% when PD not otherwise specified were included. Interestingly, the top four common PDs found in our study were similar to those reported in Zimmerman and colleague's study. Unlike their study where borderline PD was more common, obsessive-compulsive and paranoid PD were more frequently reported in our study conducted in China. The differences can perhaps, be mainly attributed to the differences in clinical profiles of samples being collected. While our sample largely comprised of patients with schizophrenia, Zimmerman and team's study primarily consisted of patients with mood and anxiety disorders. This sampling discrepancy may cause the rate of paranoid PD to increase, and borderline PD to relatively decrease. Furthermore, cross-cultural factors may also impact the frequency rates of PD: some studies mentioned that the eastern culture such as *shame* is regarded as an important moral aspect (Zhong et al. 2008), and internalized Confucian ideals such as moderation and self-discipline (Cheung et al. 1992) may contribute to obsessive-compulsive and avoidant personality traits.

Also, it is not 'equal' to compare PD prevalence rates between clinical diagnoses to structured Interview. Westen (Westen 1997) critiqued the diagnostic approach employed in PD assessment. He noted the marked discrepancy in the product of clinical and structured interviews, and his hypothesis that clinicians rely on longitudinal observations to make PD diagnoses. Therefore, the rate of PD was lower when the diagnosis was made by clinical practice than when it was made by structured interview, and it is possible that the difference in prevalence rates is due to the method of assessment in the present study. Here the questions under discussion are not only about "multi-axial versus uni-axial systems", but also the fact that Chinese clinicians are generally less willing to consider co-morbid diagnoses. We found that there was none of the PD diagnoses were dually diagnosed in Chinese psychiatric routine practice. It can be concluded that the clinical significance of personality pathology have not been considered during treatment planning in China. It also means that the outcome prediction of other mental disorders affected by the presence of PD has not been taken into consideration.

In the present study, the results suggest that the PD diagnoses in psychiatric routine are on the horns of a dilemma: the Chinese psychiatrists are usually reluctant to consider PD diagnoses in Axis II, which may cause personality pathology to be easily overlooked based on the CCMD-3 uni-axial diagnostic system in clinical work. However, there may be an overlap in criteria when diagnosing for PD using the DSM-IV (Axis II PD comorbidity rate: 47.1%). The new draft criteria for PDs in DSM-V, which puts forward a hybrid dimensional-categorical model in the personality assessment and diagnosis of PDs are currently being discussed a lot. According to this model, the PD diagnosis can be moved to Axis I, and Axis II represents personality functioning (self and interpersonal functioning) and pathological trait facets. Theoretically, at least, the proposed DSM-5 system may help to extricate PD diagnoses from a difficult position in the clinical practice. It allows for the diagnosis of specific PD in the categorical model which better reflects how Chinese clinicians work. The use of dimensional model also makes it possible for clinicians describe the personality characteristics of all patients. Thus, not merely a group of PD, a much

broader characteristic of personality pathology will gain much attention from Chinese clinicians.

Like other epidemiological surveys of PDs, several methodological issues must be considered in interpreting the prevalence rates of PDs. One of the very important issues is that both self-report tools and structured diagnostic interviews for assessing PD remain problematic: self-report tools tend to over-diagnose PD compared with interview measures, however there is weak consistency among various interview instruments (Torgersen and Alnaes 1990). In the current study, we conducted a multi-method assessment for measuring PD pathology. The high rate of self-report PDs in our sample supports that PD pathology is a common and serious phenomenon in the Chinese community. The two most common PDs were avoidant PD and obsessive-compulsive PD, which are consistent with the SCID-II clinical interview, as well as other PD epidemiological surveys for the general population in China. Aetiological beliefs about mental illnesses intensify the stigma being placed on patients with mental illness and their family members in China. Hence, the community is unlikely to approach and receive mental health assistance unless the individual is experiencing a more debilitating mental illness such as schizophrenia. Therefore, this sample was largely made up of a high percentage of patients with schizophrenia who would not normally be assessed for PDs. PD does not occur exclusively during the course of schizophrenia. However during assessment, attention has been placed on the personality characteristics, including behavior patterns, motivations, thought processes and emotions, instead of the positive (i.e. hallucinations, delusions, suspiciousness) and negative symptoms (i.e. social isolation, anhedonia, lack of affect) during the course of schizophrenia.

As for the comorbidity between DSM-IV PDs and Axis I diagnoses, our conclusion is that PDs have relatively high co-morbidity with most clinical diagnoses, which is consistent with conclusions of research abroad (Marinangeli et al. 2000; Newton-Howes et al. 2010). Several researches had found that the co-morbidity rates of PD in other types of mental disorders were between 40% and 50% (Barbato and Hafner 1998; Brieger et al. 2003). Though quite a lot of related studies are different in concrete rates the conclusions reached by the most studies hold PD and Axis I diagnosis have quite high comorbidity (Moran 1999; Iketani et al. 2002). Our results found that the co-morbidity rates of PD with schizophrenia, mood disorders and anxiety disorders (three major types of diagnoses in psychiatric clinical routine) were between  $\frac{1}{4}$  and  $\frac{1}{2}$ . In fact, mood disorders were the highest co-morbid condition with PD (42%). That figure is slightly lower than 57% which was reported by Girolamo. Both anxiety disorder and depression coupled with any subtype of PD can make the treatment process complex and slow. This suggests that future research can further investigate patients with PD and co-morbid mood disorders (especially anxiety disorder and depression).

There have always been some controversies in the classification of PDs, one of which is the overlap in the diagnosis of PD. After the DSM PD Diagnostic Criteria became widely engaged, high co-morbidity rates amongst various PDs have aroused special concerns from many researchers (Herpertz et al. 1994; Watson and Sinha 1998; Marinangeli et al. 2000). It was reported that 270 patients in psychiatric clinics met the PD diagnostic criteria, of which 60.4% (N=163) satisfied the criteria for more than one PD diagnosis, and 25.2% (N=68)



fulfilled criteria for more than two PD diagnoses (Zimmerman et al. 2005). This current study also found a relatively high co-morbidity rate among DSM-IV Axis II PDs. We mainly considered reasons from 3 aspects with regard to high co-morbidity among PDs: (1) Research subjects in this study had considerable specificity. As they were proactive seekers of the mental health service, they were more likely to divulge information about their symptoms. (2) There is a possible overlap in the symptoms exhibited in various PDs. This overlap may be caused by the sharing of similar unhealthy environments. (3) The influence of environment in the development and prevalence of PD cannot be ignored. Yet the DSM-IV criteria for PD are products of the Western culture. Caution should be taken in rigidly employing such criteria in a non-Western context such as China, where the cultural values are distinctly different from the West.

Some demographic and clinical characteristics were strongly associated with PD patients. The results of this study show that age plays an important role in diagnosing PD. Although PD is defined by stable and enduring patterns in both DSM and ICD (the international classification of diseases) diagnostic manuals, according to most studies of PD and aging, PD traits remit with age (Johnson et al. 2000; Kenan et al. 2000; Chanen et al. 2004; Lenzenweger et al. 2004). PD was also associated with single marital status, individuals who were not raised by their parents during childhood, introverted personalities, first visits, and those seeking for psycho-counseling treatment. Prior findings (Phillips and McElroy 2000; Huang et al. 2006; Bouchard et al. 2009) regarding characteristics of PD were confirmed as well. These features are useful in identifying PD in subgroups and further understanding the pathogenesis of PD. In addition, we found that mood and anxiety disorders increase an individual's susceptibility to be diagnosed with PD. Firstly, many patients with PD pathology present with more depressive and anxious symptoms. The presence of PD might also be a risk factor leading or aggravating mood or anxiety disorders. On the other hand, the presence of mood or anxiety disorder may negatively influence the diagnosing of PD (Melartin et al. 2010).

## Limitations

These results should be interpreted with caution. Several limitations must be considered. Subjects in this study were from outpatients of the largest psycho-counseling clinic and psychiatric clinic in Shanghai, it is not known if these findings can be generalized to primary care, general hospitals or rural settings. The SCID-II clinical interview was only taken for those whose PDQ-4+ screening was positive, thus the false negative rate of the PDQ-4+ was remaining unknown. Exclusion of participants whose PDQ-4+ test was negative could result in under-estimates of the overall prevalence of PDs. This study is a cross-sectional survey, although we had insisted that subjects should think and talk about "everyday life" rather than "recent situations", the potential possibility of state effects when outpatients are symptomatic impacting our PD assessment is enormous.

## Conclusions

In summary, although the rate of PD according to Chinese diagnostic manual is very low, our results suggest that personality pathology is common in psychiatric patients in China

under the DSM-IV diagnostic manual. Since substantial evidence suggests that PD influences the prognosis of other mental disorders, treatment response, and costs, progress has been made in improving diagnosis and treatment of PDs, providing support for multi-axial diagnostic systems. There are grounds to believe that this diagnosis mode serves as an advantageous tool in identifying personality pathology in Chinese populations and puts pressure on psychiatrists to pay more attention to personality aspects when considering a therapeutic intervention for psychiatric patients. Further studies should examine whether DSM-IV PD predicts early treatment responses or final functional outcomes of the other mental disorders among Chinese patients using prospective longitudinal design.

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**Table 1**

Prevalence Estimates of PD in 6 community studies in the 1990s in US and China

Country	Location	Rates (%)	Year, Author(s)	Criteria Used	Methods
U.S.	Iowa	17.9%	(Zimmerman and Coryell 1989)	DSM-III	SIDP, Structured Interview for DSM PD
U.S.	Iowa	11.1%	(Reich et al. 1989)	DSM-III	PDQ, Personality Diagnostic Questionnaire
U.S.	New York	7.3%	(Moldin et al. 1994)	DSM-III-R	PDE, PD Examination for DSM-III-R
U.S.	New York	14.8%	(Klein et al. 1995)	DSM-III-R	PDE, PD Examination for DSM-III-R
China	12 provinces	0.13%	(Chen et al. 1986)	CCMD-2	Unstructured clinical evaluation
China	7 provinces	0.1%	(Zhang et al. 1998)	CCMD-2-R	Unstructured clinical evaluation

**Table 2**

Frequency of DSM-IV PDs evaluated by PDQ-4+ in 3075 psychiatric outpatients

	Number of items	Cutoff score <sup>a</sup>	N	%	95% CI	Sensitivity	Specificity	Kappa value <sup>b</sup>
Any PDs (PDQ-4+ diagnosis)	-	-	2570	83.6%	82.3%-84.9%	-	-	-
Any Cluster A PD	-	-	1818	59.1%	57.4%-60.9%	-	-	-
Paranoid PD	7	4	1317	42.8%	41.1%-44.6%	71.58%	58.99%	0.08
Schizoid PD	7	4	663	21.6%	20.1%-23.0%	63.41%	79.59%	0.10
Schizotypal PD	9	5	1073	34.9%	33.2%-36.6%	78.16%	66.37%	0.07
Any Cluster B PD	-	-	1767	57.5%	55.7%-59.2%	-	-	-
Histrionic PD	8	5	992	32.3%	30.6%-33.9%	75.71%	68.75%	0.06
Narcissistic PD	9	5	873	28.4%	26.8%-30.0%	71.08%	72.79%	0.08
Borderline PD	9	5	1321	43.0%	41.2%-44.7%	79.78%	59.30%	0.10
Antisocial PD	8	4	691	22.5%	21.0%-23.9%	72.22%	77.82%	0.03
Any Cluster C PD	-	-	2215	72.0%	70.4%-73.6%	-	-	-
Avoidant PD	7	4	1667	54.2%	52.5%-56.0%	89.16%	48.87%	0.11
Dependent PD	8	5	924	30.0%	28.4%-31.7%	70.33%	71.18%	0.08
Obsessive-compulsive PD	8	4	1685	54.8%	53.0%-56.6%	81.97%	47.43%	0.08

Note

<sup>a</sup>Cutoff score: Each PD is determined by its own diagnostic threshold according to the DSM-IV.<sup>b</sup>Comparison of positive and negative results by self-report and structured interview.



**Table 3**

Frequency of DSM-IV PDs evaluated by the SCID-II in psychiatric outpatients

	N	%	95% CI
Any PDs (SCID-II diagnosis)	982	31.9%	30.3%-33.6%
Any Cluster A PD	312	10.1%	9.1%-11.2%
Paranoid PD	183	6.0%	5.1%-6.8%
Schizoid PD	82	2.7%	2.1%-3.2%
Schizotypal PD	87	2.8%	2.2%-3.4%
Any Cluster B PD	301	9.8%	8.7%-10.8%
Histrionic PD	70	2.3%	1.7%-2.8%
Narcissistic PD	83	2.7%	2.1%-3.3%
Borderline PD	178	5.8%	5.0%-6.6%
Antisocial PD	18	0.6%	0.3%-0.9%
Any Cluster C PD	512	16.7%	15.3%-18.0%
Avoidant PD	249	8.1%	7.1%-9.1%
Dependent PD	91	3.0%	2.4%-3.6%
Obsessive-compulsive PD	233	7.6%	6.6%-8.5%
In the Appendix of DSM-IV			
Depressive PD	260	8.5%	7.5%-9.4%
Passive-aggressive PD	112	3.6%	3.0%-4.3%

**Table 4**

Distribution of PD Diagnoses in Axis I diagnoses

SCID-II diagnosis	Schizophrenia (N=850)		Mood Disorders <sup>a</sup> (N=742)		Anxiety Disorder <sup>b</sup> (N=517)		Unspecific Diagnosis (N=481)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Any PDs	24.00%	21.13%-26.87%	42.18%	38.63%-45.74%	35.78%	31.65%-39.92%	31.39%	27.25%-35.54%
Paranoid PD	7.65%	5.86%-9.43%	7.14%	5.29%-9.00%	3.48%	1.90%-5.06%	4.57%	2.71%-6.44%
Schizoid PD	2.35%	1.33%-3.37%	3.23%	1.96%-4.51%	2.13%	0.88%-3.37%	4.16%	2.37%-5.94%
Schizotypal PD	4.35%	2.98%-5.72%	2.29%	1.21%-3.37%	2.13%	0.88%-3.37%	3.12%	1.57%-4.67%
Histrionic PD	1.18%	0.45%-1.90%	2.43%	1.32%-3.53%	4.06%	2.36%-5.76%	2.91%	1.41%-4.41%
Narcissistic PD	1.06%	0.37%-1.75%	2.83%	1.64%-4.02%	3.29%	1.75%-4.83%	4.78%	2.87%-6.69%
Borderline PD	2.00%	1.06%-2.94%	11.05%	8.80%-13.31%	3.87%	2.21%-5.53%	7.28%	4.96%-9.60%
Antisocial PD	0.24%	0-0.56%	0.13%	0-0.40%	0.77%	0.02%-1.53%	1.46%	0.39%-2.53%
Avoidant PD	7.53%	5.76%-9.30%	11.05%	8.80%-13.31%	10.06%	7.47%-12.65%	6.86%	4.60%-9.12%
Dependent PD	3.41%	2.19%-4.63%	3.50%	2.18%-4.83%	3.09%	1.60%-4.59%	1.66%	0.52%-2.81%
Obsessive-compulsive PD	3.53%	2.29%-4.77%	9.84%	7.70%-11.98%	13.35%	10.41%-16.28%	5.82%	3.73%-7.91%

Note

<sup>a</sup> Mood disorders (including bipolar disorder and depression)<sup>b</sup> Anxiety disorders (including phobia, panic disorder, generalized anxiety disorder, obsessive-compulsive disorder)

**Table 5**

## Proportion of Patients with Comorbid PDs

Groups (N=3075)	N	%	95% CI
0 PD.	2093	68.1%	66.4%–69.7%
1 PD.	546	17.8%	16.4%–19.1%
2 PDs.	280	9.1%	8.1%–10.1%
3 PDs.	156	5.1%	4.3%–5.8%

Note: 0 PD (without any diagnosis of PD); 1 PD (only one PD); 2 PDs (two combined PDs); 3 PDs (at least three combined PDs).

**Table 6**

Forward stepwise logistic regression for risk factors predicting the diagnoses of DSM-IV PD

Variable	Beta	S.E.	Odds Ratio	95%CI	Wald statistic	P value
Age	-0.021	0.005	0.98	0.97-0.99	19.08	0.000
Marriage status	-0.350	0.100	0.71	0.58-0.86	12.36	0.000
Childhood Caregiver (Parents/Others)	0.380	0.114	1.46	1.17-1.83	11.06	0.001
Temperament(Introversion/Extroversion)	0.429	0.116	1.54	1.22-1.93	13.61	0.000
Psycho-counseling /Psychiatric clinics	0.378	0.086	1.46	1.23-1.73	19.20	0.000
First visit / Subsequent visit	-0.334	0.086	0.72	0.61-0.85	15.03	0.000
Mood disorders	-0.712	0.098	0.49	0.41-0.59	53.11	0.000
Anxiety disorders	-0.325	0.106	0.72	0.59-0.89	9.35	0.002