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PSYCHOMETRIC PROPERTIES OF THE PADUA INVENTORY IN CHINESE COLLEGE SAMPLES[1,2]

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.—The aim of the present study was to investigate the psychometric properties of the Padua Inventory in Chinese college samples. Three different samples ($_1$ = 1,939, $_2$ = 1,341, and $_3$ = 298) of Chinese college students were recruited. Exploratory factor analyses yielded a four-factor structure which was similar to that found in previous studies. Further, present results showed good internal consistency as well as convergent and divergent validity with the subscales of the Symptom Checklist–90 and the Penn State Worry Questionnaire. Although no sex difference was found on total score, women had significantly higher scores on Factor 2 (Urges and worries of losing control over motor behaviors) and Factor 4 (Checking), while men had significantly higher scores on Factor 3 (Contamination). Implications of the results and directions for research are discussed.

The Padua Inventory (Sanavio, 1988) is a widely used measure of obsessive compulsive symptoms which has been adapted for various clinical settings (Steketee, 1994). It not only measures the compulsive behaviors (e.g., cleaning, checking, and so forth) but also has items for all obsessive thoughts, urges, and intrusive images (Sanavio, 1988). To assess both the extent and severity of symptoms, each item is rated on a 5-point scale for severity of disturbance, with anchors of 0: Not at all disturbing and 4: Very much disturbing. Sanavio (1988) analyzed responses of 967 nonclinical adults and found that the items loaded on four factors: (1) Impaired control over mental activities, (2) Becoming contaminated, (3) Checking behavior, and (4) Urges and worries of loss of control of motor behavior. The four-factor structure has been replicated in nonclinical samples from Italy, the USA, The Netherlands, Australia, Britain, and Iran (Sanavio, 1988; Sternberger & Burns, 1990; Kyrios, Bhar, & Wade, 1996; Macdonald & de Silva, 1999; Goodarzi & Firoozabadi, 2005). A five-factor structure (impulses, washing, checking, rumination, and precision) has been report-

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ed in some clinical samples (Van Oppen, 1992; Van Oppen, Hoekstra, & Emmelkamp, 1993).

Generally, the inventory has good psychometric properties. Sanavio (1988) first reported Cronbach's coefficients α at .90 and .94, respectively, for men and women. Several studies also found that the total score and the subscales have suitable internal consistency as Cronbach's αs were greater than .80, with the exception of the Urges and worries subscale, which has varied considerably in internal consistency reliability (Sanavio, 1988; Sternberger & Burns, 1990; Van Oppen, 1992). With regard to the convergent validity, studies have yielded correlations from .6 to .7 between the Obsessive compulsive subscale score of the Symptom Checklist–90 (Derogatis, 1977) and the total score of the Padua Inventory (Hafner & Miller, 1990; Sternberger & Burns, 1990; Van Oppen, 1992; Van Oppen, ., 1993). The total Padua Inventory score has correlated with scores on both the Maudsley Obsessive Compulsive Inventory and the Leyton Obsessional Inventory within the range of .65 to .75 (Sanavio, 1988; Sternberger & Burns, 1990; Van Oppen, 1992; Kyrios, ., 1996). As expected, neither extraversion nor psychoticism was highly correlated with Padua Inventory scores (Sanavio, 1988; Van Oppen, 1992). For instance, Van Oppen, *et al.* (1993) observed lower correlations of the Padua Inventory with the Symptom Checklist–90 Depression subscale (=.48), Anxiety subscale (=.46), and the Eysenck Personality Questionnaire Neuroticism scale (=.32). On the other hand, small correlations (range=–.33 to .20) were observed between all Padua Inventory subscales and Extraversion, Social Desirability, and Psychoticism (Van Oppen, *et al.*, 1993). Given that obsessive-compulsive disorder is an independent diagnosis in the spectrum of anxiety disorders, it is not surprising to find that the Padua Inventory total score had only a rather moderate correlation with measures of neuroticism, depression, dysphoria, and anxiety (Sanavio, 1988; Hafner & Miller, 1990; Sternberger & Burns, 1990; Van Oppen, 1992).

Few studies have been conducted using clinical samples with obsessive-compulsive disorder (OCD). Sanavio (1988) reported that the Padua Inventory discriminated OCD patients from nonobsessional neurotic patients matched for sex and age. However, in a study of three Iranian clinical samples, Goodarzi and Firoozabadi (2005) reported that the Padua Inventory differentiated OCD patients from a normal control group, but not from groups of anxious and depressed patients. This is consistent with studies showing that those with high scores on the Padua Inventory also reported more depression and generalized anxiety disorder (e.g., Burns, Keortge, Formea, & Sternberger, 1996). In addition, some research has indicated that Padua Inventory scores, especially on the two obsessional subscales, might measure worry in addition to obsession (Burns,

al., 1996; Freeston, Rheaume, & Ladouceur, 1996). These findings support the Padua Inventory's discrimination between OCD patients and controls, but less well from anxious and depressed groups.

Sanavio (1988) reported that women scored significantly higher than men on the total Padua Inventory score, but this finding is at odds with other studies (Sternberger & Burns, 1990; Van Oppen, 1992; Van Oppen, *al.*, 1993; Kyrios, ., 1996; Goodarzi & Firoozabadi, 2005). Furthermore, two studies showed that women had significantly higher scores on the factor Urges and worries of losing control over motor behaviors (Sternberger & Burns, 1990; Macdonald & de Silva, 1999).

The Padua Inventory has been used in a number of different nations and cultures, including Italy (Sanavio, 1988), The Netherlands (Van Oppen, 1992), North America (Sternberger & Burns, 1990), Australia (Hafner & Miller, 1990; Kyrios, *et al.*, 1996), Britain (Macdonald & de Silva, 1999), Spain (Mataix-Cols & Sanchez, 2000; Ibáñez, Olmedo, Peñate, & González, 2002; Mataix-Cols, 2002), and Iran (Goodarzi & Firoozabadi, 2005). All studies have provided psychometric information from nonclinical or clinical samples. However, no data concerning the Padua Inventory's reliability and validity are available in China. Therefore, it is necessary and valuable to study the inventory within the Chinese culture.

The present study is based on data from nonclinical samples of college students in mainland China. The data form part of a larger series of studies of affective states associated with obsessive-compulsive phenomena. More specifically, the aims of the present study were: (a) to obtain the initial norms for a Chinese nonclinical sample and to examine sex differences; (b) to explore the factor structure, the internal consistency, and test-retest reliabilities in Chinese college students; and (c) to assess the convergent and divergent validity by investigating correlations between scores on the Padua Inventory and other measures related to symptoms of OCD.

Method

Three samples of university students were recruited for the present study. The participants were volunteers and all the data were collected through a group test.

Sample 1 consisted of 1,939 college students from Beiing Chemical University (847 men, 985 women, 107 sex unspecified), with an age range of 15 to 39 yr., of whom 18- to 24-yr.-old students made up 94% (age = 19.7 yr., = 2.9). Sample 2 from Peking University included 1,341 undergraduate students (797 men, 519 women, 25 sex unspecified), with an age range of 16 to 30 yr., of which 18- to 24-yr.-old students made up 96% (age = 19.2 yr., = 2.1).

To test the inventory's validity, Sample 2 participants also completed other questionnaires such as the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; Wang, Wang, & Ma, 1999), the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990; Sha, Wang, Liu, & Zhong, 2006), the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Wang, ., 1999), and the Symptom Checklist–90 (Derogatis, 1977; Chen & Li, 2003).

Sample 3 at the Wuhan University of Technology comprised 298 stu-

.—The Penn State Worry Questionnaire (Meyer, *et al.*, 1990; Sha, *et al.*, 2006) has 16 items rated on a 5-point scale with anchors 1: Not at all typical of me and 5: Very typical of me. Cronbach's α in Chinese college samples has been reported at .91 (Zhong, Wang, Li, & Liu, 2009).

.—The Beck Depression Inventory (BDI; Beck, *et al.*, 1961; Wang, ., 1999) has 21 items which instruct individuals to select one statement that suitable for their current situation out of four. Cronbach's α of the Chinese version of BDI was .89 in a sample of 335 normal Chinese adults and 38 depression patients (Zhang, Wang, & Qian, 1990).

.—The Symptom Checklist–90 (SCL–90; Derogatis, 1977; Wang, 1984) is a 90-item checklist with nine symptom scales rated on a 5-point scale with anchors 0: Not at all and 4: Extremely. Chen and Li (2003) re-evaluated the Chinese version of the SCL–90 and supported its use in the Chinese population.

.—The Eysenck Personality Questionnaire–Revised Short Scale for Chinese (Eysenck & Eysenck, 1996; Qian, *et al.*, 2000) has 48 items and four subscales: Neuroticism (N), Extraversion (E), Psychoticism (P), and Lie (L). Cronbach's α of the four subscales were in the .60–.78 range (Qian, *et al.,* 2000).

Procedure

The participants in Samples 1, 2, and 3 all were given the Chinese Version of the Padua Inventory. Sample 2 also completed a bat ery of four self-report questionnaires within a 1-hr. period. The anxiety and worry symptoms were assessed using the State-Trait Anxiety Inventory, Penn State Worry Questionnaire, and Beck Depression Inventory. The Symptom Checklist–90 was used to measure self-estimated mental health status. In Sample 3, personality also was assessed with the Eysenck Personality Questionnaire–Revised Short Scale. This sample was retested with the Padua Inventory four weeks a fer the f rst test.

Statistical Analyses

Data analyses were conducted in several stages. First, using the data from Samples 1 and 2, a principal component analysis with varimax rotation was applied at the item level of the Padua Inventory (60 items). A loading of ≥ 0.40 was considered to be signi fcant. Then Cronbach's coeff cient α was calculated for the total score. Second, convergent and divergent validity were measured separately using data from Samples 2 and 3. The test-retest reliability was also estimated using data from Sample 3.

Results

Factor Analysis

Participants in Sample 1 (= 1,939) and Sample 2 (n = 1,341) were included in a factor analysis. The principal components analysis was itera-

TABLE 1

Components and Loadings Over .40 and Correlations Between Items and Factors (=3,280)

Item	Loading	Item-factor Correlation	^{2}
Component 1: Impaired control over mental activities			
11. When doubts and worries come to my mind, I cannot rest until I have talked them over with a reassuring person.	.42	.53	.29
12. When I talk I tend to repeat the same things and the same sentences several times.	.43	.58	.34
18. I have to do things several times before I think they are properly done.	.42	.60	.47
26. I find it difficult to take decisions, even about unimportant matters.	.57	.63	.39
27. Sometimes I am not sure I have done things which, in fact, I know I have done.	.53	.62	.38
28. I have the impression that I will never be able to explain things clearly, especially when talking about important matters that involve me.	.61	.65	.43
29. After doing something carefully, I still have the impression I have either done it badly or not finished it.	.69	.73	.56
31. I invent doubts and problems about most of the things I do.	.66	.71	.52
32. When I start thinking of certain things, I become obsessed with them.	.68	.69	.51
33. Unpleasant thoughts come into my mind against my will and I cannot get rid of them.	.70	.74	.56
34. Obscene or dirty words come into my mind and I cannot get rid of them.	.48	.61	.40
35. My brain constantly goes its own way and I find it difficult to attend to what is happening around me.	.62	.68	.47
36. I imagine catastrophic consequences as a result of absent-mindedness or minor errors which I make.	.66	.70	.51
37. I think or worry at length about having hurt someone without knowing it.	.68	.70	.52
38. When I hear about a disaster, I think it is somehow my fault.	.58	.64	.41
39. I sometimes worry at length for no reason that I have hurt myself or have some disease.	.50	.62	.41
42. When I read I have the impression I have missed something important and must go back and reread the passage at least two or three times.	.54	.62	.38
43. I worry about remembering completely unimportant things and make an effort not to forget them.	.45	.61	.41
44. When a thought or doubt comes into my mind, I have to examine it from all points of view and cannot stop until I have done so.	.57	.64	.41
45. In certain situations I am afraid of losing my self-control and doing embarrassing things.	.62	.67	.46
52. I sometimes feel something inside me which makes me do things which are really senseless and which I do not want to do.	.54	.66	.49

(continued on next page)

TABLE 1 (cont'd)
Components and Loadings Over .40 and Correlations Between Items and Factors (=3,280)

Item	Loading	Item-factor Correlation	^{2}
58. In certain situations I feel an impulse to eat too much, even if I am then ill.	.46	.53	.30
% Variance explained = 29.9			
Component 2: Urges and worries of losing control over motor behaviors			
40. I sometimes start counting objects for no reason.	.43	.57	.33
46. When I look down from a bridge or a very high window, I feel an impulse to throw myself into space.	.46	.63	.32
47. When I see a train approaching, I sometimes think I could throw myself under its wheels.	.71	.71	.53
48. At certain moments, I am tempted to tear of my clothes in public.	.74	.68	.55
49. While driving, I sometimes feel an impulse to drive the car into someone or something.	.66	.70	.48
50. Seeing weapons excites me and makes me think violent thoughts.	.54	.67	.34
53. I sometimes feel the need to break or damage things for no reason.	.49	.67	.42
54. I sometimes have an impulse to steal other people's belongings, even if they are of no use to me.	.68	.67	.50
55. I am sometimes almost irresistibly tempted to steal something from the supermarket.	.69	.63	.50
56. I sometimes have an impulse to hurt defenseless children or animals.	.64	.65	.45
57. I feel I have to make special gestures or walk in a certain way.	.48	.61	.38
% Variance explained = 5.3			
Component 3: Contamination			
1. I feel my hands are dirty when I touch money.	.59	.60	.36
2. I think even slight contact with bodily secretions (perspiration, saliva, urine, etc.) may contaminate my clothes or somehow harm me.	.68	.71	.50
3. I fnd it di f cult to touch an object when I know it has been touched by strangers or by certain people.	.62	.67	.47
4. I fnd it di f cult to touch garbage or dirty things.	.64	.68	.45
5. I avoid using public toilets because I am afraid of disease and contamination.	.64	.65	.44
6. I avoid using public telephones because I am afraid of contagion and disease.	.65	.66	.47
7. I wash my hands more of en and longer than necessary.	.61	.66	.47
8. I sometimes have to wash or clean myself simply because I think I may be dirty or "contaminated."	.59	.68	.46
9. If I touch something I think is "contaminated," I immediately have to wash or clean myself.	.62	.69	.47
10. If an animal touches me, I feel dirty and immediately have to wash myself or change my clothing.	.56	.65	.42
% Variance explained = 4.9			

(continued on next page)

TABLE 1 (cont'd)
Components and Loadings Over .40 and Correlations Between Items and Factors (= 3,280)

Item	Loading	Item-Factor Correlation	^{2}
Component 4: Checking			
18. I have to do things several times before I think they are properly done.	.52	.70	.47
19. I tend to keep on checking things more often than necessary.	.63	.77	.57
20. I check and recheck gas and water taps and light switches after turning them off.	.72	.80	.63
21. I return home to check doors, windows, drawers, etc., to make sure they are properly shut.	.69	.76	.57
22. I keep on checking forms, documents, checks, etc., in detail, to make sure I have filled them in correctly.	.65	.78	.59
23. I keep on going back to see that matches, cigarettes, etc., are properly extinguished.	.64	.69	.51
24. When I handle money, I count and recount it several times.	.58	.66	.47
25. I check letters carefully many times before posting them.	.62	.72	.49
% Variance explained = 3.2			

tively tested, followed by varimax rotation to investigate the four-factor structure of the Padua Inventory. The Kaiser-Meyer-Olkin (KMO) test result was .96, suggesting the factor analysis of the variables is appropriate. The analysis indicated that there were five components with eigenvalues larger than 1.00, (17.7, 3.2, 3.0, 1.9, 1.4) but a scree test and the pattern of loadings suggested a four-factor structure. Following Sanavio (1988), items which loaded on more than one factor or had a loading of less than .40 were deleted, resulting in 11 items being deleted. Items 13, 14, 15, 16, 17, 30, 41, 51, 59, and 60 had unsatisfactory loadings, while Item 18 loaded on more than one factor. The remaining 49 items accounted for 43% of the variance. Table 1 presents the factor loadings on items after varimax rotation, and the Pearson correlations between each factor and the included items are also shown along with communalities. These correlations ranged from .50 to .80, and were statistically significant (= .01).

Factor 1 (22 items) had an eigenvalue of 17.7, which represented 29% of the variance and was termed "Impaired control over mental activities." Fifteen of the items loading on this factor overlapped with the same subscale in the study of Sanavio (1988). However, two items included in this factor did not meet the .40 criterion (Item 59: "When I hear about a suicide or a crime, I am upset for a long time and find it difficult to stop thinking about it"; Item 30: "I am sometimes late because I keep on doing things more often than necessary"). In this study, seven additional items (12, 18, 39, 42, 45, 52, and 58) loaded on this factor. Items 42 and 45 had also loaded on this factor in Sternberger and Burns' study (1990).

Factor 2 (11 items) had an eigenvalue of 3.22, accounting for 5% of the variance, and was named "Urges and worries of losing control over motor behaviors." The items which loaded on this factor showed it to be similar to Sanavio's fourth factor. Of the four items (40, 48, 50, 56) loading on this factor that were not in Sanavio's factor, three (40, 50, 56) were also reported as items for this factor by Kyrios, *et al.* (1996) in an Australian nonclinical sample, and by Goodarzi and Firoozabadi (2005) in Iranian clinical and nonclinical samples.

Factor 3 (10 items) had an eigenvalue of 3.00, accounting for 5% of the variance, and was named "Contamination." The items loading on this factor were identical to those found on Sanavio's second factor.

Factor 4 (8 items) had an eigenvalue of 1.93, accounting for 3% of variance, and was named "Checking." The items that loaded on this factor were the same as Sanavio's third factor.

Cronbach's α was calculated for each factor by sex and the total score (Table 2). Values for these Chinese samples were satisfactory, confirming the internal consistency reliability of this Chinese version among students. A Guttmann split-half test yielded estimates of reliability of .91, .82, .82, and .83 for the four factors, respectively, once again supporting internal consistency for these samples.

TABLE 2
Cronbach α For Padua Inventory Factors by Sex (=3,280)

Cronbach α	Factor 1	Factor 2	Factor 3	Factor 4
Total	.94	.85	.86	.88
Men	.93	.85	.86	.88
Women	.93	.83	.85	.87

$p < .01$ (two-tailed test).

The test-retest correlations in Sample 3 after a 4-wk. interval were calculated, and coefficients for each factor are shown in Table 3. As coef-

TABLE 3
Four-week Test-retest Correlations For Padua Inventory Factors by Sex (=298) With 95% Confidence Intervals

Test-retest	Factor 1		Factor 2		Factor 3		Factor 4	
		95%		95%		95%		95%
Total	.86*	.83, .89	.78*	.73, .82	.63*	.56, .69	.69*	.63, .75
Men	.86*	.83, .89	.70*	.64, .75	.64*	.57, .70	.61*	.54, .68
Women	.85*	.82, .88	.72*	.66, .77	.68*	.61, .74	.64*	.57, .70

*$p < .01$ (two-tailed test).

cients between .6 and .9 are considered appropriate values for longitudinal stability, all subscales displayed good stability over the interval for both men and women in college.

To examine the inter-factor correlations in the Chinese samples, correlations were calculated among factors and total score for Samples 1 and 2. The results are shown in Table 4.

TABLE 4
Inter-correlations of Padua Inventory Factors and Total Score (=3,280) With 95% Confidence Intervals

	Total Score		Factor 1		Factor 2		Factor 3	
		95%		95%		95%		95%
Factor 1	.94*	.93, .95						
Factor 2	.72*	.70, .74	.61*	.59, .63				
Factor 3	.69*	.67, .71	.49*	.46, .52	.38*	.35, .41		
Factor 4	.81*	.80, .82	.70*	.68, .72	.47*	.44, .50	.49*	.46, .52

*$p < .01$(two-tailed test).

Convergent and Divergent Validity

Using the data from Sample 2, Pearson correlation coe f cients were calculated among the Padua Inventory scores and those on the State-Trait Anxiety Inventory, Symptom Checklist–90, Beck Depression Inventory, and Penn State Worry Questionnaire. The correlations between the Padua Inventory total scores and the Eysenck Personality Questionnaire scores were calculated using the data from Sample 3.

Table 5 indicates that the Padua Inventory total score correlated statistically signi f cantly with the scores on Trait and State Anxiety and the Beck Depression Inventory, although Padua Inventory subscale scores did not exhibit the same pa t ern of relations. Most correlations in Table 5 were statistically signi f cant with the exception of the Pearson correlation on Factor 4 (Checking) with Psychoticism and Social desirability of the Eysenck Personality Questionnaire.

More speci f cally, as expected, the Padua Inventory total scale had a moderate positive, statistically signi f cant correlation with the Obsessive-compulsive subscale of Symptom Checklist–90, and a negative correlation with the Eysenck Personality Questionnaire Extraversion scale. Furthermore, moderate, statistically signi f cant correlations were found on the Padua Inventory total scores with the scores of Symptom Checklist–90 Depression subscale, Anxiety subscale, and Eysenck Personality Questionnaire Neuroticism. Symptom Checklist–90 Anxiety generally correlated more strongly with obsessional Factors 1 and 2 of the Padua Inventory

TABLE 5
Correlations for Padua Inventory Factors and Total Score with Other Measures

		Factor 1	Factor 2	Factor 3	Factor 4	PI Total Score
State Trait Anxiety Inventory						
State	1,341	.43	.34	.21	.28	.42
95%		.39, .47	.29, .39	.16, .26	.23, .33	.37, .46
Trait	1,341	.54	.33	.27	.31	.50
95%		.50, .58	.28, .38	.22, .32	.26, .36	.46, .54
EPQ	298					
Neuroticism		.63	.38	.31	.42	.58
95%		.56, .69	.28, .47	.20, .41	.32, .51	.50, .65
Extraversion		−.35	−.20	−.05	−.16	−.27
95%		−.45, −.25	−.30, −.09		−.27, −.05	−.37, −.16
Psychoticism		.19	.20	.12	.10	.19
95%		.08, .30	.09, .31	.01, .23		.08, .30
Lie		−.17	−.14	−.06	−.11	−.15
95%		−.28, −.06	−.25, −.03			−.26, −.04
SCL–90	1,341					
Obsessive compulsive		.69	.48	.35	.50	.67
95%		.66, .72	.44, .52	.30, .40	.46, .54	.64, .70
Depression		.65	.48	.28	.38	.60
95%		.62, .68	.44, .52	.23, .33	.33, .43	.56, .63
Anxiety		.66	.53	.32	.44	.64
95%		.63, .69	.49, .57	.27, .37	.40, .48	.61, .67
Interpersonal sensitivity		.65	.47	.32	.44	.63
95%		.62, .68	.43, .51	.27, .37	.40, .48	.60, .66
Hostility		.54	.61	.29	.39	.57
95%		.50, .58	.58, .64	.24, .34	.34, .43	.53, .60
BDI score	1,341	.51	.50	.26	.31	.50
95%		.47, .55	.46, .54	.21, .31	.26, .36	.46, .54
PSWQ score	1,341	.16	.10	.03	.11	.14
95%		.11, .21	.05, .15		.06, .16	.08, .19

.—For all correlations above .11, $p < .01$ (two-tailed); BDI: Beck Depression Inventory; EPQ: Eysenck Personality Questionnaire; PSWQ: Penn State Worry Questionnaire.

(.53 to .66) than with compulsive Factors 3 and 4 (.35 to .50). In addition, the correlations between the Padua Inventory total scores with those on the Interpersonal Sensitivity and Hostility subscales of Symptom Checklist–90 were .63 and .57, respectively. These two subscales had larger correlations with the Padua Inventory obsession factors than with compulsion factors; Factor 1 correlated most strongly with both the Symptom Checklist–90 subscales and other measures. The other Padua Inventory factors had slightly lower correlations, lowest on Factor 3 (Contamination).

Finally, lower correlations were found among all Padua Inventory

scales and Extraversion, Social Desirability, and Psychoticism. The correlations show a pattern similar to those for comparable measures in other studies (Sanavio, 1988). However, the magnitudes of the correlations for Padua Inventory factors with other measures were variable, indicating heterogeneity in obsessionality.

Sex Differences

Means and standard deviations for the Padua Inventory total score are given in Table 6, using data from participants in Samples 1 and 2 who had fully completed the inventory. Data in Table 6 show there is little overall difference between men and women, and do not replicate Sanavio's 1988 finding that Italian women scored significantly higher. In a preliminary analysis, scores were summed for each of the four factors. While mean scores indicated no significant sex effect on Factor 1, scores were significantly higher for women on Factor 2 (= 5.38, < .001; Cohen's d = .09) and Factor 4 (= 5.15, < .001; Cohen's d = .09) and significantly higher for men on Factor 3 (= −4.23, < .001; Cohen's d = −.07), reflecting higher scores for women on Checking and Worries of losing control over motor behavior.

TABLE 6
Means and Standard Deviations For Padua Inventory Total Score and Factors by Sex

Padua Inventory	Total (= 3,280)		Men (= 1,644)		Women (= 1,504)	
Factor 1	16.29	12.89	15.59	12.02	15.95	12.48
Factor 2	2.96	4.55	2.16	3.76	2.58	4.21
Factor 3	6.57	5.39	7.40	5.68	6.97	5.55
Factor 4	5.29	4.97	4.43	4.45	4.88	4.74
Total	34.27	26.48	32.60	24.24	33.46	25.44

Discussion

The four-factor structure of the Padua Inventory previously repeated was reproduced in these Chinese samples of college students, and the general content of the four factors was similar to that obtained from other populations in Western and Asian countries (Sternberger & Burns, 1990; Kyrios, ., 1996; Macdonald & de Silva, 1999; Goodarzi & Firoozabadi, 2005). However, the factor sequences in the present study were somewhat different. In the present study, Urges and worries of losing control over motor behaviors was treated as the second factor, but it was viewed as the third or fourth factor in studies by Sanavio and others (Sternberger & Burns, 1990; Van Oppen, 1992; Macdonald & de Silva, 1999).

Both Factor 1 (Impaired control over mental activities) and Factor 2 (Urges and worries of losing control over motor behaviors) belong to the obsession category, containing a total of 33 items, relatively more than

those of other studies. In contrast, Factor 3 (Contamination) and Factor 4 (Checking) have a total of 18 items, relatively fewer than in other studies. This probably arises from cultural differences, suggesting that in the Chinese population, Urges and worries represents a larger proportion of obsessive compulsive symptoms than Contamination and Checking. However, no definitive statement can be made that obsessive phenomena are more prevalent than compulsive phenomena in Chinese patients with obsessive-compulsive disorder. An alternative explanation might be that these samples of university undergraduates are less representative of the general Chinese population than were the Dutch (Van Oppen, 1992) and Italian (Sanavio, 1988) samples. Further research should be done to understand the reason for these differences.

The Padua Inventory can be divided into two subscales, with Factors 1 and 2 making up an Obsession scale and Factors 3 and 4 making up a Compulsion scale. The pattern of inter-correlations on such subscales was consistent to that reported in previous studies (Van Oppen, 1992; Kyrios, *et al.*, 1996). The Padua Inventory Obsession score moderately correlated with the Compulsion score, which is not surprising given that obsessions and compulsions generally coexist in people with obsessive compulsive symptoms.

As expected, the Padua Inventory total score generally exhibited moderate correlations with the Obsessive Compulsive subscale of Symptom Checklist–90, and somewhat lower correlations with measures of depression and anxiety, which are commonly associated with Obsessive Compulsive Disorder. The Urges and worries factor is an important component of the inventory as it was originally designed to assess obsessive compulsive phenomena which were not adequately measured by other scales (Sanavio, 1988). This factor includes items which might assess depressed or agitated and suicidal behavior (e.g., "When I see a train approaching, I sometimes think I could throw myself under its wheels"). Hence, one might expect a correlation with measures of depression or depression and anxiety, an expectation that was borne out in the present study of students.

An argument could be made that depression and anxiety measures correlate higher with measures of obsessive rather than with compulsive symptoms. This would call into question the construct validity of the Padua Inventory, and whether items purportedly assessing intrusive thoughts are distinguishable from items assessing other forms of negative thinking like depression or worry. Moreover, some studies (Freeston, *et al.*, 1994) have found that many of the Padua Inventory Obsession items loaded onto a "worry" factor consisting of items from the Penn State Worry Questionnaire. This result suggests that some of the Padua Inventory

Obsession items may, in fact, measure worry rather than obsessions. Two publications have noted the correlation of the scores on the Padua Inventory with a measure of worry (Freeston, *et al.*, 1994; Burns, *et al.*, 1996), which is viewed as a central feature of generalized anxiety disorder but has some overlapping features with Factor 1 of the Padua Inventory and, by extrapolation, obsessive compulsive disorder. The correlations of the Padua Inventory scores (particularly Factor 1) with the score on Eysenck Personality Questionnaire Neuroticism and the Depression/Anxiety subscales in Symptom Checklist–90 probably reflect such overlap. However, in the present study, the correlations between the scores on Padua Inventory subscales and the Penn State Worry Questionnaire were separately calculated. The data of Table 5 show correlations were not very high, even with obsession subscales, which suggest that statistical significance here merely arises from the large sample size.

With regard to cross-national variation, the aim of the present research was not to comment on cultural factors which may influence scores on the Padua Inventory, as this needs to be studied in more detail with a different design. Nonetheless, given the range of scores across cultures, it is necessary to caution against the use of the Padua Inventory where appropriate normative data are not available. What the results of the present study suggest is that for a sample of Chinese college students, a 49-item inventory with 4-factor structure may be more suitable than the original 60 items.

The present study yielded no sex difference in the Padua Inventory total scores. This contrasts with Sanavio's result (1988) that women's mean total score was significantly higher than that for men, and replicates previous studies (Macdonald & de Silva, 1999; Goodarzi & Firoozabadi, 2005). However, there were sex differences, for women scored considerably higher than men on the factors Urges and worries and Checking. Given the different patterns of results in the different clusters of undergraduate students, more data and evidence are needed to draw clear conclusions.

In sum, it appears that the main structure of obsessive-compulsive symptoms is adequately assessed by the Padua Inventory. Present study results for samples of Chinese students support the Padua Inventory as reliable, based on evidence of adequate convergent validity, internal consistency reliability, and test-retest reliability. However, some caveats should be mentioned. Divergent validity requests further investigation, and the sensitivity of subscales for treatment effect should also be addressed. Research also needs to be done concerning the inventory's discriminant validity. All of these would require representative samples, which in China would be a massive undertaking, given the many distinct people groups and cultural traditions.

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