Psychological Assessment
2009, Vol. 21, No. 1, 125–130

1040-3590/09/$12.00 DOI: 10.1037/a0014502

BRIEF REPORTS

Assessment of Borderline Personality Features in Population Samples: Is the Personality Assessment Inventory–Borderline Features Scale Measurement Invariant Across Sex and Age?

Marleen H. M. De Moor and Marijn A. Distel
VU University Amsterdam

Timothy J. Trull
University of Missouri—Columbia

Dorret I. Boomsma
VU University Amsterdam

Borderline personality disorder (BPD) is more often diagnosed in women than in men, and symptoms tend to decline with age. Using a large community sample, the authors investigated whether sex and age differences in four main features of BPD, measured with the *Personality Assessment Inventory–Borderline Features* scale (PAI-BOR; Morey, 1991), are a result of measurement bias or if they represent true differences. The PAI-BOR was completed by four Sex × Age groups (N = 6,838). Multigroup confirmatory factor analysis showed that the PAI-BOR is measurement invariant across sex and age. Compared with men, women reported more borderline characteristics for affective instability, identity problems, and negative relationships but not for self-harm. Younger men had higher scores for identity problems and self-harm than did older men. Younger women had higher scores for identity problems and affective instability than did older women. Results suggest that the PAI-BOR can be used to study the etiology of BPD features in population-based samples and to screen for BPD features in clinical settings in both men and women of varying ages.

Keywords: borderline personality disorder, measurement invariance, population samples, sex and age differences

Borderline personality disorder (BPD) is a severe personality disorder with features such as emotional lability, impulsivity, interpersonal difficulties, identity disturbance, and cognitive impairment (American Psychiatric Association, 2000). Individuals with BPD are well-represented in treatment settings, accounting for 10% of all outpatients and 15–20% of all inpatients (Skodol et al., 2002). In the general population, approximately 1% of adults meet the diagnostic criteria for BPD (Lenzenweger, Lane, Loranger, & Kessler, 2007; Torgersen, Kringlen, & Cramer, 2001).

A meta-analysis of 75 studies by Widiger and Trull (1993) showed that 75% of those diagnosed with BPD in clinical samples are women. However, this rate could represent sex bias in diagnosis instead of a true sex difference in prevalence rate (Skodol & Bender, 2003). Estimates of sex prevalence rates for BPD in nonclinical studies using structured interviews are inconsistent. Some report higher prevalence rates in women (e.g., Maier, Lichtermann, Klingler, Heun, & Hallmayer, 1992) and others report higher rates in men (e.g., Coid, Yang, Tyrer, Roberts, & Ullrich, 2006). The only two large representative population-based studies (Lenzenweger et al., 2007; Torgersen et al., 2001) did not find sex differences in the prevalence of BPD.

BPD is typically diagnosed for the first time in young adulthood, and many studies report that the prevalence rate decreases with age (Lenzenweger et al., 2007). Two longitudinal studies report on the course of BPD symptoms in treatment-seeking adults. The McLean Study of Adult Development (Zanarini et al., 2007) described a model of borderline psychopathology in which some symptoms are temperamental and others are more acute and resolve rapidly. The Colloborative Longitudinal Personality Disorder Study (Skodol et al., 2005) presented a similar model that divided symptoms into symptomatic behavior, which is episodic and reactive in nature, and traits, which are more fundamental and enduring. A third longitudinal study, the Children in Community study (Skodol, Johnson, Cohen, Sneed, & Crawford, 2007), assessed personality disorders in a population-based sample of 658 individuals and reported a decline in symptom levels from adolescence to adulthood. The longitudinal course of BPD is of clinical importance because those with a personality disorder present since adolescence are more likely to experience greater impairment in adulthood (Skodol et al., 2007).

Marleen H. M. De Moor, Marijn A. Distel, and Dorret I. Boomsma, Department of Biological Psychology, VU University Amsterdam, Amsterdam, the Netherlands; Timothy J. Trull, Department of Psychological Sciences, University of Missouri—Columbia.

The first two authors contributed equally.

Correspondence concerning this article should be addressed to Marijn A. Distel, Department of Biological Psychology, VU University Amsterdam, van der Boechorststraat 1, 1081 BT, Amsterdam, the Netherlands. E-mail: ma.distel@psy.vu.nl

The issue concerning sex and age differences in the severity of BPD features is important for clinical researchers studying the nature and causes of BPD and for clinicians treating BPD patients. Large representative general population studies are needed to determine whether the sex and age differences commonly found in BPD features represent true biological or sociocultural differences between men and women or at different ages or whether they reflect measurement bias. Self-report questionnaires are a practical alternative to psychiatric interviews in large population samples, given that features assessed in the questionnaires have predictive value for the disorder under study (Hopwood et al., 2008; Jacobo, Blais, Baity, & Harley, 2007; Stein, Pinkster-Aspen, & Hilsenroth, 2007). A commonly used self-report measure of BPD features is the *Personality Assessment Inventory–Borderline Features* scale (PAI-BOR; Morey, 1991). On the basis of a review of the historical conceptualizations of BPD and on empirical studies, potential PAI-BOR items were generated to reflect core factors of the construct, which are affective instability, identity problems, negative relationships, and self-harm/impulsivity. Prior studies have shown the PAI-BOR to be reliable and valid and support the usefulness of the PAI-BOR in assessing BPD features in the general population as well as BPD features in clinical settings (Kurtz, Morey, & Tomarken, 1993; Trull, 1995).

To investigate sex and age differences, one must first establish that the measurement instrument is invariant with respect to sex and age. Measurement invariance (MI) implies that the distribution of observed variables given the underlying factors is the same across groups (Meredith, 1993). This means that given a certain level of BPD features, all individuals have the same probability of a certain response on a certain item, irrespective of, for example, their age or sex.

We examined whether the PAI-BOR is measurement invariant with respect to sex and age and tested whether the PAI-BOR scale measures the same underlying constructs in young and older adult men and women. Second, we tested whether there are differences across sex and age in BPD features in the adult population.

Method

Sample

Data on BPD features came from a large study in adults registered with the Netherlands Twin Registry (Boomsma et al., 2006). In 2004–2005, data on the PAI-BOR were collected in 8,527 participants from 3,267 families. For more details on the sample, see Distel et al. (2007, 2008). We created four groups: young adult men, young adult women (18–35 years), older adult men, and older adult women (36–90 years). Cutoffs for age were based on studies of the longitudinal course of BPD and normal personality, which showed that BPD symptoms and general personality traits stabilize between the ages of 30 and 40 years (McCrae & Costa, 1990; Stone, 1990).

The four Sex × Age groups had unequal sample sizes, with more women than men. To create groups of roughly similar size, we randomly selected 1 individual per family in the two groups of women. This made the observations in these groups now independent, but dependency was still present in the two groups of men. The resulting sample consisted of 6,838 individuals. There were 1,409 men aged 18–35 years, 1,878 men aged 36–90 years, 1,711 women aged 18–35 years, and 1,840 women aged 36–90 years.

Measures

The PAI-BOR (Morey, 1991) consists of four subscales (each with six items), which reflect four characteristics of BPD: Affective Instability (AI), Identity Problems (IP), Negative Relationships (NR), and Self-Harm (SH). There are four response categories (0 = *false,* 1 = *slightly true*, 2 = *mainly true*, and 3 = *very true*). Because the most extreme category, *very true*, was not endorsed frequently in this general population sample, we combined this category with the category *mainly true*, thus analyzing three instead of four categories. An overview of the items, the dimensions on which they load, and their endorsement frequencies are given in Table 1. According to the manual of the PAI-BOR (Morey, 1991), a total PAI-BOR raw score of 38 or more indicates the presence of significant BPD features, whereas a score of 60 or more indicates typical borderline personality functioning. The sample prevalence of significant BPD features was 1.4% ($n = 98$), whereas a BPD diagnosis was suggested for 0.03% of the sample ($n = 2$).

Statistical Analysis

Multigroup confirmatory factor analysis for ordinal data was used to test for MI with respect to sex and age (Flora & Curran, 2004; Millsap & Yun-Tein, 2004). Different multigroup confirmatory factor analysis models were fitted to the data in Mplus Version 4.12 (L. K. Muthén & Muthén, 2005), using the weighted least squares mean variance adjusted estimator and correcting for any dependency in the data due to the family clustering (B. O. Muthén & Satorra, 1995; Rebollo, De Moor, Dolan, & Boomsma, 2006). In short, the four-factor model (Morey, 1991) was fitted to the items in each Sex × Age group, assuming an underlying latent continuous response for each item in each group. First, all parameters of the model (thresholds that specify the relationships between observed discrete scores and latent continuous responses, the residual variances of the latent responses, and the factor loadings that specify the relationships between latent responses and latent factors) were allowed to vary in each group. Next, different sets of constraints on the parameters were applied across groups to test for different types of MI. The first, most general level of MI is configural invariance. *Configural invariance* implies that the same factor structure holds for the different groups; in this study, it is the four-factor solution for the PAI-BOR scale with the same items loading on the same factors (i.e., the pattern of the loadings is invariant but the estimates of the loadings may differ). This is tested by fitting the hypothesized factor model to the data in all groups and by evaluating the model fit. If the factor model fits adequately well, one can move forward to test the second level of MI, which is metric invariance. *Metric invariance* implies that the latent factor scores predict the item responses equally well across groups. This is tested by constraining factor loadings to be equal across groups. This model is compared with the configural invariance model and, if the fit is not appreciably worse, it is taken as evidence of metric invariance. The third step in evaluating MI is to also impose constraints on the thresholds, such that MI of the factor means can be tested (*strong factorial invariance*). If both thresholds and factor loadings are the same across groups, this means that any difference in latent response means across groups is the result of differences in factor means. A last step is to test,

Table 1
Endorsement Frequencies of the 24 Items of the Personality Assessment Inventory–Borderline Features Scale and Their Dimensions

		Men						Women					
		18–35 years			36–90 years			18–35 years			36–90 years		
Factor	Item description	0	1	2/3	0	1	2/3	0	1	2/3	0	1	2/3
AI	1. Mood shifts	0.44	0.44	0.11	0.48	0.44	0.08	0.31	0.51	0.18	0.44	0.45	0.11
AI	4. Moods intense	0.62	0.29	0.09	0.65	0.28	0.07	0.47	0.36	0.18	0.61	0.30	0.09
AI	7. Mood steady[a]	0.21	0.39	0.40	0.22	0.37	0.40	0.11	0.34	0.55	0.18	0.32	0.50
AI	10. Little control over anger	0.87	0.11	0.02	0.83	0.15	0.02	0.87	0.11	0.02	0.85	0.14	0.01
AI	14. Happy person[a]	0.37	0.49	0.14	0.31	0.47	0.22	0.33	0.44	0.23	0.28	0.45	0.27
AI	18. Can't express all of anger	0.65	0.22	0.13	0.65	0.24	0.11	0.62	0.24	0.14	0.66	0.22	0.12
IP	2. Attitude about self changes	0.68	0.27	0.06	0.72	0.24	0.03	0.52	0.34	0.14	0.61	0.33	0.06
IP	5. Feel empty	0.71	0.23	0.06	0.74	0.22	0.04	0.56	0.32	0.12	0.59	0.33	0.08
IP	8. Worry about people leaving	0.72	0.23	0.05	0.78	0.17	0.05	0.57	0.33	0.10	0.72	0.21	0.07
IP	11. Wonder about life	0.62	0.29	0.10	0.78	0.18	0.04	0.63	0.27	0.10	0.74	0.21	0.05
IP	15. Can't handle separation	0.24	0.41	0.35	0.20	0.39	0.42	0.14	0.38	0.49	0.18	0.40	0.42
IP	19. Don't get bored[a]	0.40	0.40	0.21	0.51	0.32	0.18	0.38	0.40	0.22	0.60	0.24	0.16
NR	3. Relationships stormy	0.77	0.17	0.06	0.81	0.14	0.05	0.78	0.16	0.07	0.85	0.11	0.05
NR	6. Let people know they've hurt me	0.60	0.30	0.10	0.55	0.35	0.09	0.56	0.34	0.11	0.49	0.39	0.12
NR	9. People let me down	0.56	0.32	0.11	0.52	0.37	0.12	0.49	0.37	0.15	0.41	0.41	0.18
NR	12. Rarely lonely[a]	0.43	0.31	0.27	0.41	0.26	0.33	0.29	0.33	0.39	0.34	0.26	0.40
NR	16. Mistakes in picking friends	0.52	0.34	0.14	0.47	0.39	0.14	0.43	0.37	0.20	0.43	0.40	0.17
NR	20. Stay friends with people[a]	0.17	0.60	0.23	0.29	0.53	0.18	0.16	0.59	0.25	0.33	0.53	0.15
SH	13. Do things impulsively	0.74	0.21	0.05	0.80	0.18	0.03	0.75	0.21	0.04	0.74	0.22	0.04
SH	17. When upset hurt self	0.96	0.03	0.01	0.96	0.02	0.01	0.95	0.04	0.01	0.97	0.02	0.01
SH	21. Too impulsive	0.60	0.30	0.10	0.57	0.33	0.10	0.59	0.31	0.10	0.48	0.36	0.16
SH	22. Spend money easily	0.47	0.36	0.17	0.63	0.28	0.09	0.49	0.34	0.17	0.60	0.32	0.08
SH	23. Reckless person	0.80	0.17	0.03	0.91	0.08	0.01	0.88	0.11	0.01	0.94	0.05	0.01
SH	24. Careful about money[a]	0.25	0.48	0.27	0.33	0.46	0.21	0.25	0.47	0.29	0.33	0.43	0.25

Note. Categories 2 and 3 have been combined because of low endorsements of these categories. AI = Affective Instability; IP = Identity Problems; NR = Negative Relationships; SH = Self-Harm.
[a] This item has been recoded, such that a score of 3 corresponds to answering *false* on the unrecoded items.

besides the factor loadings and thresholds, whether the residual variances of the latent responses are also equal across groups (*strict factorial invariance*). If strict factorial invariance holds, differences in factor scores across groups are due to a true difference on the same latent construct and not to differences in measurement of this construct. It is then allowed to interpret differences in both means and covariances of the latent factors across groups as true differences in the latent constructs.

Model fit was evaluated by the adjusted chi-square test (B. O. Muthén, Du Toit, & Spisic, 1997) and by the root mean square error of approximation (RMSEA; Steiger, 1990). Comparison of models when testing the different stages of MI was based on the adjusted chi-square difference test and the change in value of RMSEA. We included the RMSEA to evaluate model fit, because it is much more robust to sample size and model complexity than the chi-square test (Schermelleh-Engel & Moosbrugger, 2003) and because it performs well in factor models with categorical data (Yu, 2002). According to the general guidelines available for independent continuous and categorical data (Schermelleh-Engel & Moosbrugger, 2003; Yu, 2002), an RMSEA smaller than 0.05 is considered as good fit, values between 0.05 and 0.08 indicate adequate fit, values between 0.08 and 0.10 mediocre fit, whereas values larger than 0.10 are not acceptable. In addition to the chi-square test and RMSEA, we always closely inspected the parameter estimates to make trustworthy decisions when testing for MI.

Results and Discussion

Results from fitting the four-factor model for the different stages of MI tested across sex and age are given in Table 2. Estimates of unconstrained factor loadings and residual variances are given in Table 3. The fit of the four-factor model with parameters unconstrained across groups was mediocre, as indicated by the RMSEA value of 0.088. The fit of the model when different types of constraints are made was not worse, based on the RMSEA. We tried factor solutions other than the four-factor model as proposed in the PAI-BOR manual (data not shown), but these models did not have better fit. Thus, we accepted the four-factor model and concluded that configural invariance holds across sex and age. This conclusion is strengthened by the observation that for most items, there are no striking differences in either factor loadings or residual variances, although for some items the differences are more substantial. The largest differences are found for some of the items from the SH factor. For example, Item 17 ("when upset hurt self") loads somewhat higher on the SH factor in women than in men. Items 22, 23, and 24, about spending money and reckless behavior, load higher on the SH factor in younger than in older adults in both men and women, but the SH factor does not seem to explain more variance of the items in younger adults. The differences in factor loadings and residual variances across groups are significant on the basis of the chi-square difference test but are accompanied by minor changes in the RMSEA. When tested across sex or age, the fit of the strict factorial invariance model tested

Table 2
Model Fitting Results for Measurement Invariance Tested Across Sex and Age

	χ^2	*df*	#par	$\Delta\chi^2$	Δdf	RMSEA
Sex						
Configural invariance	7,985.934	558	312			0.088
Metric invariance	5,817.759	474	264	79.856	39	0.081
Strong factorial invariance	6,951.693	544	224	237.995	54	0.083
Strict factorial invariance	6,196.432	515	176	336.178	75	0.080
Age						
Configural invariance	7,985.934	558	312			0.088
Metric invariance	5,922.654	476	264	122.447	40	0.082
Strong factorial invariance	7,523.730	548	224	580.532	55	0.086
Strict factorial invariance	6,665.108	517	176	622.160	76	0.083

Note. χ^2 = adjusted chi-square test statistic; *df* = adjusted degrees of freedom; #par = number of free parameters in the model; $\Delta\chi^2$ = adjusted chi-square difference between the fitted model and the comparison model (configural invariance model); Δdf = adjusted difference in degrees of freedom between fitted and comparison models (note that this is not simply the difference in number of free parameters); RMSEA = root mean square error of approximation.

was mediocre (RMSEA = 0.08). Thus, the strict factorial invariance model describes the data reasonably well and not worse than the full configural invariance model. This leads to the conclusion that the PAI-BOR is measurement invariant with respect to sex and age. There are several studies of sex bias, but not many have addressed the issue of measurement invariance. The results from a nonclinical study by Jane, Oltmanns, South, and Turkheimer (2007) are in line with our results, finding that *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; American Psychiatric Association, 2000) BPD criteria as assessed via a semistructured interview were not influenced by sex bias. Boggs et al. (2005) found some evidence for sex bias in *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM –IV*; American Psychiatric Association, 1994) criteria for BPD, but results were not consistent. To our knowledge, the present article is the first to address age invariance in BPD features.

Table 3
Estimates of Factor Loadings and Residual Variances Unconstrained Across Groups From the Four-Group Confirmatory Four-Factor Model

		Standardized factor loadings				Standardized residual variances			
		Men		Women		Men		Women	
Factor	Item description	18–35 years	36–90 years	18–35 years	36–90 years	18–35 years	36–90 years	18–35 years	36–90 years
AI	1. Mood shifts	0.70	0.71	0.73	0.73	0.52	0.48	0.48	0.47
AI	4. Moods intense	0.75	0.74	0.81	0.79	0.44	0.41	0.37	0.36
AI	7. Mood steady[a]	0.63	0.59	0.67	0.59	0.60	0.66	0.55	0.66
AI	10. Little control over anger	0.60	0.65	0.67	0.66	0.63	0.65	0.50	0.57
AI	14. Happy person[a]	0.58	0.55	0.68	0.55	0.64	0.69	0.58	0.70
AI	18. Can't express all of anger	0.57	0.53	0.56	0.55	0.71	0.72	0.67	0.69
IP	2. Attitude about self changes	0.71	0.73	0.72	0.70	0.47	0.45	0.51	0.51
IP	5. Feel empty	0.83	0.81	0.82	0.78	0.31	0.36	0.32	0.43
IP	8. Worry about people leaving	0.60	0.55	0.63	0.59	0.63	0.67	0.62	0.65
IP	11. Wonder about life	0.62	0.70	0.71	0.70	0.66	0.51	0.49	0.48
IP	15. Can't handle separation	0.16	0.14	0.05	0.21	0.98	0.98	0.98	0.98
IP	19. Don't get bored[a]	0.38	0.40	0.38	0.35	0.87	0.86	0.85	0.86
NR	3. Relationships stormy	0.55	0.51	0.54	0.55	0.76	0.74	0.71	0.65
NR	6. Let people know they've hurt me	0.60	0.55	0.53	0.48	0.69	0.71	0.70	0.75
NR	9. People let me down	0.58	0.56	0.61	0.55	0.67	0.68	0.63	0.70
NR	12. Rarely lonely[a]	0.61	0.53	0.72	0.60	0.62	0.71	0.48	0.64
NR	16. Mistakes in picking friends	0.52	0.54	0.44	0.51	0.75	0.72	0.79	0.74
NR	20. Stay friends with people[a]	0.19	0.21	0.23	0.27	0.95	0.96	0.95	0.95
SH	13. Do things impulsively	0.77	0.80	0.73	0.74	0.43	0.39	0.42	0.49
SH	17. When upset hurt self	0.70	0.75	0.84	0.81	0.35	0.47	0.35	0.38
SH	21. Too impulsive	0.73	0.73	0.72	0.68	0.42	0.51	0.42	0.62
SH	22. Spend money easily	0.60	0.49	0.70	0.46	0.68	0.69	0.61	0.66
SH	23. Reckless person	0.72	0.59	0.77	0.68	0.60	0.57	0.42	0.42
SH	24. Careful about money[a]	0.41	0.35	0.48	0.33	0.83	0.85	0.81	0.86

Note. AI = Affective Instability; IP = Identity Problems; NR = Negative Relationships; SH = Self-Harm.
[a] This item has been recoded, such that a score of 3 corresponds to answering *false* on the unrecoded items.

A consequence of measurement invariance is that sex and age differences in means and correlations of the factors can be interpreted as true differences in dimensions of BPD features. Table 4 gives the estimates of the factor means and correlations and their confidence intervals. The differences in mean factor scores between any two groups in Table 4 can be interpreted as effect sizes because in each group the variance is fixed at 1. Women scored, on average, higher on the AI, IP, and NR dimensions of the PAI-BOR in both age groups. The effect sizes are 0.40, 0.40, and 0.33 for AI, IP, and NR in the young age group and 0.14, 0.30, and 0.22 for AI, IP, and NR in the older age group, respectively. In the older age group, women scored, on average, higher on the SH dimension also, but their average score was still lower than the scores in young men and women. Other studies using the PAI-BOR found men to have significantly higher scores than women for the total PAI-BOR scale (Trull, 1995), or did not find any sex differences (Morey, 1991). A number of large population-based studies reveal no significant sex differences in the prevalence of BPD (e.g., Lenzenweger et al., 2007; Torgersen et al., 2001). In contrast, for individual *DSM–IV* (American Psychiatric Association, 1994) criteria, Johnson et al. (2003) found more women to meet the identity disturbance criterion and McCormick et al. (2007) found more women to meet the stress-related paranoia criterion. Our study also suggests that sex differences in BPD features might be dimension specific.

There are also age differences in factor means. In men, average scores on IP and SH are higher in the younger age group, whereas scores on AI and NR are equal between the two age groups. In women, the scores on IP and AI were higher in the younger age group than in the older age group. There are no age differences for NR and SH in women. It is important to note that we compared the means of younger and older men and women but we did not study all of the possible interactions between sex and age. Largely consistent with our results, Morey (1991) reported a decrease in mean scores for all four PAI-BOR subscales as a function of age. Other studies reported a lower prevalence of BPD in older subjects (Lenzenweger et al., 2007; Torgersen et al., 2001) and a remission of some symptoms with increasing age, whereas other symptoms are more persistent (Skodol et al., 2005, 2007; Zanarini et al., 2007).

In young and old men and women, AI, IP, and NR are strongly interrelated, whereas SH is only moderately correlated with the other three dimensions. In women, the dimensions are more strongly correlated in the youngest age group, and the differences between the age groups are significant for the interrelations between AI, IP, and NR and for NR with SH. In men, the SH dimension is more strongly correlated with AI and IP in the oldest age group, whereas the AI, IP, and NR dimensions are more strongly correlated in the youngest age group, and these differences are significant for all interrelations except between AI and IP. The moderate correlation between SH and the other dimensions was also found in the clinical sample reported by Morey (1991).

Our main finding that the PAI-BOR is measurement invariant across sex and age has several implications. Sex and age differences in PAI-BOR scores represent true differences in the dimensions. This is important knowledge for future use of the PAI-BOR in nonclinical and clinical settings. In clinical settings, self-report measures are increasingly recommended as screening instruments for initial evaluations of BPD features instead of time-consuming structured interviews (Hopwood et al., 2008). Our results suggest that the PAI-BOR is a suitable instrument to be used by clinicians with patients of different sexes and varying ages, for example, to determine if a clinical interview is required to further assess BPD features and *DSM–IV* diagnostic criteria. The PAI-BOR is also useful in assessing BPD features in epidemiological samples, such as those required for studies into the genetic basis of BPD.

It will be important for researchers conducting future studies to attempt to identify the sources of the mean differences in PAI-BOR

Table 4
Estimates of Factor Means and Correlations From the Four-Group Confirmatory Four-Factor Model (Strict Factorial Invariance Model)

	Men				Women			
	18–35 years		36–90 years		18–35 years		36–90 years	
Factor	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
M								
AI	0		0.00	−0.08; 0.09	0.40	0.32; 0.49	0.14	0.06; 0.22
IP	0		−0.34	−0.43; −0.24	0.40	0.31; 0.49	−0.04	−0.13; 0.05
NR	0		0.06	−0.04; 0.15	0.33	0.23; 0.42	0.28	0.19; 0.37
SH	0		−0.31	−0.40; −0.22	−0.07	−0.17; 0.02	−0.15	−0.24; −0.06
Correlations								
AI with								
IP	0.82	0.75; 0.88	0.81	0.76; 0.86	0.92	0.87; 0.96	0.83	0.78; 0.88
NR	0.84	0.77; 0.90	0.73	0.68; 0.79	0.84	0.78; 0.91	0.74	0.68; 0.79
SH	0.51	0.44; 0.58	0.60	0.54; 0.65	0.48	0.41; 0.54	0.44	0.38; 0.50
IP with								
NR	0.86	0.79; 0.93	0.75	0.69; 0.82	0.91	0.85; 0.97	0.80	0.74; 0.86
SH	0.42	0.35; 0.50	0.54	0.48; 0.61	0.44	0.38; 0.51	0.41	0.34; 0.47
NR with								
SH	0.54	0.46; 0.62	0.60	0.53; 0.66	0.56	0.49; 0.63	0.42	0.36; 0.49

Note. The means in the first group were fixed to zero and therefore there are no confidence intervals. CI = confidence interval; AI = Affective Instability; IP = Identity Problems; NR = Negative Relationships; SH = Self-Harm.

scores in both age and sex groups. These investigations may be more informative regarding both the etiological influences on the manifestation of BPD features as well as the possibility of different treatment targets depending on a BPD patient's sex and age.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Boggs, C. D., Morey, L. C., Skodol, A. E., Shea, M. T., Sanislow, C. A., Grilo, C. M., et al. (2005). Differential impairment as an indicator of sex bias in *DSM–IV* criteria for four personality disorders. *Psychological Assessment, 17,* 492–496.

Boomsma, D. I., de Geus, E. J. C., Vink, J. M., Stubbe, J. H., Distel, M. A., Hottenga, J. J., et al. (2006). Netherlands Twin Register: From twins to twin families. *Twin Research and Human Genetics, 9,* 849–857.

Coid, J., Yang, M., Tyrer, P., Roberts, A., & Ullrich, S. (2006). Prevalence and correlates of personality disorder in Great Britain. *British Journal of Psychiatry, 188,* 423–431.

Distel, M. A., Ligthart, L., Willemsen, G., Nyholt, D. R., Trull, T. J., & Boomsma, D. I. (2007). Personality, health and lifestyle in a questionnaire family study: A comparison between highly cooperative and less cooperative families. *Twin Research and Human Genetics, 10,* 348–353.

Distel, M. A., Trull, T. J., Derom, C. A., Thiery, E. W., Grimmer, M. A., Martin, N. G., et al. (2008). Heritability of borderline personality disorder features is similar across three countries. *Psychological Medicine, 38,* 1219–1229.

Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods, 9,* 466–491.

Hopwood, C. J., Morey, L. C., Edelen, M. O., Shea, M. T., Grilo, C. M., Sanislow, C. A., et al. (2008). A comparison of interview and self-report methods for the assessment of borderline personality disorder criteria. *Psychological Assessment, 20,* 81–85.

Jacobo, M. C., Blais, M. A., Baity, M. R., & Harley, R. (2007). Concurrent validity of Personality Assessment Inventory Borderline Scales in patients seeking dialectical behavior therapy. *Journal of Personality Assessment, 88,* 74–80.

Jane, J. S., Oltmanns, T. F., South, S. C., & Turkheimer, E. (2007). Gender bias in diagnostic criteria for personality disorders: An item response theory analysis. *Journal of Abnormal Psychology, 116,* 166–175.

Johnson, D. M., Shea, M. T., Yen, S., Battle, C. L., Zlotnick, C., Sanislow, C. A., et al. (2003). Gender differences in borderline personality disorder: Findings from the collaborative longitudinal personality disorders study. *Comprehensive Psychiatry, 44,* 284–292.

Kurtz, J. E., Morey, L. C., & Tomarken, A. J. (1993). The concurrent validity of three self-report measures of borderline personality. *Journal of Psychopathology and Behavioral Assessment, 15,* 255–266.

Lenzenweger, M. F., Lane, M. C., Loranger, A. W., & Kessler, R. C. (2007). *DSM–IV* personality disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 62,* 553–564.

Maier, W., Lichtermann, D., Klingler, T., Heun, R., & Hallmayer, J. (1992). Prevalences of personality disorders (*DSM–III–R*) in the community. *Journal of Personality Disorders, 6,* 187–196.

McCormick, B., Blum, N., Hansel, R., Franklin, J. A., John, D. S., Pfohl, B., et al. (2007). Relationship of sex to symptom severity, psychiatric comorbidity, and health care utilization in 163 subjects with borderline personality disorder. *Comprehensive Psychiatry, 48,* 406–412.

McCrae, R. R., & Costa, P. T., Jr. (1990). *Personality in adulthood.* New York: Guilford Press.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika, 58,* 525–543.

Millsap, R. E., & Yun-Tein, J. (2004). Assessing factorial invariance in ordered-categorical measures. *Multivariate Behavioral Research, 39,* 479–515.

Morey, L. C. (1991). *The Personality Assessment Inventory: Professional manual.* Lutz, FL: Psychological Assessment Resources.

Muthén, B. O., Du Toit, S. H. C., & Spisic, D. (1997). Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. Retrieved from http://www.gseis.ucla.edu/faculty/muthen/articles/Article_075.pdf

Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology, 25,* 267–316.

Muthén, L. K., & Muthén, B. O. (2005). *Mplus user's guide* (3rd ed.). Los Angeles: Muthén & Muthén.

Rebollo, I., De Moor, M. H. M., Dolan, C. V., & Boomsma, D. I. (2006). Phenotypic factor analysis of family data: Correction of the bias due to dependency. *Twin Research and Human Genetics, 9,* 367–376.

Schermelleh-Engel, K., & Moosbrugger, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8,* 23–74.

Skodol, A. E., & Bender, D. S. (2003). Why are women diagnosed borderline more than men? *Psychiatric Quarterly, 74,* 349–360.

Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The borderline diagnosis: I. Psychopathology, comorbidity, and personality structure. *Biological Psychiatry, 51,* 936–950.

Skodol, A. E., Gunderson, J. G., Shea, M. T., McGlashan, T. H., Morey, L. C., Sanislow, C. A., et al. (2005). The Collaborative Longitudinal Personality Disorders Study (CLPS): Overview and implications. *Journal of Personality Disorders, 19,* 487–504.

Skodol, A. E., Johnson, J. G., Cohen, P., Sneed, J. R., & Crawford, T. N. (2007). Personality disorder and impaired functioning from adolescence to adulthood. *British Journal of Psychiatry, 190,* 415–420.

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research, 25,* 173–180.

Stein, M. B., Pinkster-Aspen, J. H., & Hilsenroth, M. J. (2007). Borderline pathology and the personality assessment inventory (PAI): An evaluation of criterion and concurrent validity. *Journal of Personality Assessment, 88,* 81–89.

Stone, M. H. (1990). *The fate of borderline patients: Successful outcome and psychiatric practice.* New York: Guilford Press.

Torgersen, S., Kringlen, E., & Cramer, V. (2001). The prevalence of personality disorders in a community sample. *Archives of General Psychiatry, 58,* 590–596.

Trull, T. J. (1995). Borderline personality disorder features in nonclinical young adults: I. Identification and validation. *Psychological Assessment, 7,* 33–41.

Widiger, T. A., & Trull, T. J. (1993). Borderline and narcissistic personality disorders. In P. Sutker & H. Adam (Eds.), *Comprehensive textbook of psychopathology* (2nd ed., pp. 371–394). New York: Plenum Press.

Yu, C. Y. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes.* Unpublished doctoral dissertation, University of California, Los Angeles. Retrieved from http://www.statmodel.com/download/Yudissertation.pdf

Zanarini, M. C., Frankenburg, F. R., Reich, D. B., Silk, K. R., Hudson, J. I., & McSweeney, L. B. (2007). The subsyndromal phenomenology of borderline personality disorder: A 10-year follow-up study. *American Journal of Psychiatry, 164,* 929–935.

Received November 27, 2007
Revision received June 9, 2008
Accepted October 6, 2008 ■