THE FACTORIAL VALIDITY OF THE MASLACH BURNOUT INVENTORY–STUDENT SURVEY IN CHINA[1]

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Summary.—The dimensional structure of the Maslach Burnout Inventory–Student Survey (MBI–SS) was investigated using data collected from three samples of Chinese students in two high schools, a university, and a nursing school, respectively (total N = 1,499; 36% males, 64% females; M age 19.0 yr., SD = 1.3). Single group Confirmatory Factor Analyses corroborated the hypothesized three-factor model for the composite sample as well as for the three independent samples. Subsequent multigroup analyses revealed that the three-dimensional structure of the MBI–SS is partially invariant across three samples. It is concluded that the MBI–SS can be used to assess burnout in Chinese students.

The term "burnout" was first used to describe a syndrome of mental weariness specifically observed among human service professionals because they were involved in emotionally demanding contacts with recipients such as clients and patients (Freudenberger, 1974; Maslach, 1982). A brief self-report questionnaire—the Maslach Burnout Inventory (MBI)—was developed to assess burnout amongst those who do "people work of some kind" (Maslach & Jackson, 1986, p. 1). The MBI includes three dimensions that constitute burnout: emotional exhaustion, which refers to feelings of being depleted of one's emotional resources, representing the basic individual stress component of the syndrome; depersonalization, which refers to negative, cynical, or excessively detached responses to other people at work, representing the interpersonal component of burnout; and reduced personal accomplishment, which refers to feelings of decline in one's competence and productivity and to a lowered sense of efficacy, representing the self-evaluation component of burnout (Maslach, 1993).

Soon it became clear, however, that burnout was not restricted to the human services workers, but could also be found in a wide variety of occupations such as managers (Lee & Ashforth, 1993), the military (Leiter, Clark, & Durup, 1994), and entrepreneurs (Gryskiewicz & Buttner, 1992). Hence, the concept of burnout was extended to other professions and occupational groups (Maslach, Schaufeli, & Leiter, 2001). The need for a measure of burnout in contexts other than the service professions was met

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by the introduction of MBI–General Survey (Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI–General Survey consists of the three dimensions that parallel those of the original MBI in the sense that they are more generic and do not refer to other people with whom one is working. That is, the first dimension, exhaustion, is measured by items that tap fatigue but do not make direct reference to other people as the source of one's tiredness. The items that measure cynicism reflect indifference or a distant attitude towards work in general, not necessarily toward other people. Finally, professional efficacy has a broader focus compared to the corresponding original MBI scale, encompassing both social and nonsocial aspects of occupational accomplishment.

It is likely that burnout also occurs among students, although formally speaking, students are neither employed nor do they hold jobs. However, from a psychological perspective their core activities can be considered "work." Namely, they are engaged in structured, obligatory activities, e.g., attending classes and completing assignments, that are directed toward a specific goal, e.g., passing examinations (Schaufeli & Taris, 2005). Education is very serious in China, where highly competitive exams regulate admission to high schools and universities and thus determine students' career prospects. In China, teaching quality is assessed by students' examination scores, which means that students' grades are directly linked to the teacher's salary and reputation. Consequently, teachers put students under severe pressure to perform. A survey among 15,000 Chinese high school students revealed that one-fifth had suicidal ideation and more than two-thirds felt stressed by the high study demands put on them (Institute of Child and Adolescent Health, 2007). Hence, although originally being considered a work-related phenomenon, burnout may also exist in (Chinese) students, in which it manifests as feeling exhausted because of study demands, having a cynical and detached attitude toward one's study, and feeling incompetent as a student.

Indeed, during the past decades, various studies on student burnout have been carried out (e.g., Pines, Aronson, & Kafry, 1981; Meier & Schmeck, 1985; Fimian, Fastenau, Tashener, & Cross, 1989; Gold, Bachelor, & Michael, 1989; Balogun, Helgemoe, Pellegrini, & Hoeberlein, 1996; Chang, Rand, & Strunk, 2000; Yang, 2004; Yang & Cheng, 2005). These studies assessed "academic burnout" in students, using slightly modified versions of the MBI or the MBI–General Survey, in which, for instance, "instructors" was substituted for "recipients" of one's care or instructions (e.g., Gold & Michael, 1985; Balogun, *et al.*, 1996), for instance, "I can easily understand how my instructor (instead of recipients) feels about things." However, a substitution like this is problematic because it might change the meaning of the particular item. Therefore, Schaufeli, Martínez, Mar-

qués-Pinto, Salanova, and Bakker (2002) proposed to use the MBI–Student Survey to assess burnout in students. Instead of merely substituting "instructors" for "recipients," the items of the MBI–General Survey were reformulated to fit the academic context better. More particularly, the exhaustion items of the MBI–Student Survey refer to severe fatigue caused by study demands, the cynicism items refer to the student's mental distance from his studies, and the efficacy items refer to academic accomplishment.

While the MBI–Student Survey has been shown to have adequate reliability and factorial validity in Dutch, Spanish, and Portuguese students (Schaufeli, *et al.*, 2002), its factorial validity has not yet been established in different types of Chinese students. Previous studies with the original version of the MBI suggested cultural differences between Western and Eastern countries, with, for instance, respondents from Japan and Taiwan showing higher burnout than those from North America (Golembiewski, Boudreau, Munzenrider, & Luo, 1996). Moreover, the Chinese emphasis on outstanding academic achievement, which is highly valued in the Confucian tradition, calls for investigating the generalizability of the three burnout dimensions as operationalized by the MBI–Student Survey in China.

The present study examined the factorial validity of the MBI–Student Survey in Chinese students. More specifically, it investigated whether the hypothesized three-factor structure of the MBI–Student Survey is invariant across students who were enrolled in different types of academic settings, i.e., high school, university, and vocational school (a nursing school). It was expected that the three-factor structure of the MBI–Student Survey would be replicated and that the factor structure will be invariant across these three Chinese student samples. Factorial invariance is important because this means that factor loadings and correlations between factors can be similarly interpreted across different samples. In other words, factorial invariance confirms the robustness of the factor structure.

<div align="center">METHOD</div>

Participants

A random two-stage cluster sampling technique was used. In the first stage, three equal-sized student groups ($n = 121$) were randomly selected from the Guli high school of the Zhejiang Province; Grade 2 from Zhejiang Normal University; and the nursing school in Yongkang City of the Zhejiang Province. Table 1 presents the sex distribution, age, distribution across years in school, and response rates of the three subsamples and the composite sample ($n = 363$). This composite sample is denoted as the validation sample.

TABLE 1
THE TWO-STAGE SAMPLE CHARACTERISTICS AND THE RESPONSE RATE ($N = 1,499$)

	Sex (%)		Age, yr.		Year of Study (%)						Response Rate (%)
	Male	Female	M	SD	1st	2nd	3rd	4th	5th	6th	
Validation sample ($n=363$)											
Composite sample ($n=363$)	33	67	18.9	1.0							95
High School ($n=121$)	56	44	17.0	1.7	3.3	2.7	4.2	5.0	5.3	3.66	100
University ($n=121$)	41	59	20.8	0.8	0.0	100	0.0	0.0			88
Nursing School ($n=121$)	1.00	99	18.8	1.3	27.3	37.2	35.5				98
Cross-validation sample ($n=1,136$)											
High School ($n=380$)	59	41	17.2	1.8	15.8	16.1	17.1	16.0	13.9	16.50	94
University ($n=370$)	49	51	20.7	0.8	0.0	100	0.0	5.0	7.0	8.0	70
Nursing School ($n=386$)	2.00	98	18.6	1.4	23.1	43.0	33.9	0.0			88

After one week, in the second stage, three more student groups were randomly selected: 380 students of the Mingzhu high schools in the Zhejiang Province; 370 university students in Grade 2 of the Zhejiang Normal University; and 386 nursing students of the nursing school in Yongkang city of the Zhejiang province. Table 1 also presents the sex distribution, age, distribution across years in school, and response rate of the three subsamples and the composite sample ($n = 1,136$). This sample is denoted as the cross-validation sample. Thus, the total sample included 533 men (36%) and 966 women (64%) and their mean age was 19 yr. ($SD = 1.27$).

Procedure

The survey was accompanied by a letter explaining the nature and the general aim of the study and emphasizing the anonymity of the participants. The questionnaire was filled out during class, under the supervision of a research assistant. Completion time was approximately 20 min., and boxes in designated areas in the classroom allowed for the return of the surveys. A total of 1,499 surveys was returned, which corresponds with an overall response rate of 86.2%.

Measure

The Maslach Burnout Inventory–Student Survey (Schaufeli, *et al.*, 2002). —This questionnaire includes three subscales: Exhaustion was measured with five items (e.g., "I feel emotionally drained by my studies"), Cynicism was measured with four items (e.g., "I have become more cynical about the potential usefulness of my studies"), and Academic Efficacy was measured with six items (e.g., "In my opinion, I am a good student"). All items were scored on a 7-point frequency rating scale ranging from 0: Never to 6: Always. High scores on Emotional Exhaustion, Cynicism, and *low* scores on Academic Efficacy are indicative of burnout (Academic Efficacy items are reverse scored).

At first, the MBI–Student Survey was translated from English into Chinese by three native Chinese-speaking master's degree students in psychology, working independently of each other. Next, semantic differences in translations were discussed and a final common translation was agreed upon. Finally, the questionnaire was checked by a native-speaking English teacher who was fluent in Chinese as well.

Data Analysis

In order to evaluate the dimensional structure of the MBI–Student Survey, a two-stage approach was adopted. First, using the composite validation sample of 363 students, preliminary single-group analyses were carried out to test the fit of the hypothesized three-factor model. Confirmatory factor analysis (CFA) with maximum likelihood estimation was carried out, using the AMOS 5.0 computer program (Arbuckle, 1997). In

the first step, the relative fit of the one-factor model and the hypothesized three-factor correlated model was assessed, and the null model, in which all constructs were assumed to be uncorrelated and measured without error, served as a basis for model comparison. The one-factor model assumes that all items of the three subscales load on one general student burnout factor, whereas the three-factor model assumes three correlated subscales of the MBI–Student Survey, i.e., Emotional Exhaustion, Cynicism, and Academic Efficacy. In the second step, the fit of the model was improved, using the so-called Modification Indices to relax originally fixed model parameters. Finally, in the third step, to examine its robustness, the revised model was cross-validated separately in each of the three fresh groups of the cross-validation sample, i.e., high school students, university students, and nursing students.

When the MBI–Student Survey is applied to different groups, issues of measurement equivalence become important. Namely, when a model fits the data of a particular sample, that does not automatically mean that it also fits the data of other samples. Therefore, a multigroup analysis was carried out to test the invariance of the correlations between factors, factor loadings, and correlated errors across the three independent samples. An iterative process was used as recommended by Byrne (2001) to assess the invariance of each estimate separately.

Each model was estimated using maximum likelihood. Since the χ^2 test statistic depends on sample size, which leads to the rejection of any model in a large enough sample (Browne & Cudeck, 1993a), a number of alternative goodness-of-fit indices was employed to help select the most appropriate model (Bentler, 1990; Steiger, 1990; Jöreskog & Sörbom, 1993). In addition to the χ^2 statistic, four other fit indices are reported: the Goodness-of-Fit Index (GFI), the Nonnormed Fit Index (NNFI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). For comparing the relative fit of two nested models, the chi-squared difference test ($\Delta\chi^2$) is used. For GFI, NNFI, and CFI, a value of about .90 is recommended as an acceptable cutoff (Bentler, 1990; McDonald & Marsh, 1990), and, as a rule of thumb, values smaller than .08 for RMSEA are considered indicative of an acceptable fit (Browne & Cudeck, 1993b).

Results

Factorial Validity

Step 1: CFA-single group analyses (validation sample).—Fit statistics for the three substantive models in the composite validation sample ($n = 363$), as well as for the null model, are presented in Table 2. The three-factor model fitted the data significantly better than the one-factor model, suggesting that student burnout can be understood in terms of three empiri-

TABLE 2
Model Tests, Composite Validation Sample ($n = 363$)

Model	χ^2	df	GFI	NNFI	CFI	RMSEA
Null	2059.85	105	.39	.00	.00	.23
One-factor	554.42	90	.81	.72	.76	.12
Three-factor	379.19	87	.87	.82	.85	.10
Three-factor, revised	265.20	83	.91	.88	.91	.08

Note.—GFI = Goodness-of-Fit Index; NNFI = The Nonnormed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

cally related dimensions: Exhaustion, Cynicism, and (reduced) Academic Efficacy. However, the fit of the three-factor model is not very good and can further be improved.

Step 2: Modification of Step 1 results (validation sample).—Inspection of the Modification Indices indicated that allowing four unique variances of item scores within particular subscales to correlate (e1-e4, e10-e13, e11-e14, e6-e15) would improve the fit of the three-factor model. As can be seen from Table 2, the revised model meets the criteria for good model fit in the composite sample.

Step 3: Cross-validation.—Next, to cross-validate the revised model, it was separately tested in each independent student group. As shown in Table 3, the revised three-factor model (including the four correlated errors) fits well to the data of all three samples with values of the fit indices mostly meeting their respective criteria. The parameter estimates of the revised model in the three independent samples are displayed in Fig. 1. Although all parameter estimates are significant, Fig. 1 shows relatively low standardized factor parameter estimates of two exhaustion items (Item 4: "I feel used up at the end of a day at school" and Item 13: "Studying or attending a class is really a strain for me").

TABLE 3
Test of the Revised Three-factor Model in the Three Independent Cross-validation Samples

Model	χ^2	df	GFI	NNFI	CFI	RMSEA
High school students ($n = 380$)	210.16	83	.930	.916	.933	.064
University students ($n = 370$)	239.73	83	.922	.874	.900	.072
Nursing students ($n = 386$)	195.09	83	.935	.866	.894	.059

Note.—GFI = Goodness-of-Fit Index; NNFI = The Nonnormed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

Descriptive Analyses

Table 4 shows sex differences and values of Cronbach coefficient alpha of the MBI–Student Survey scores in the three independent samples. Independent samples *t* test revealed that male high school students
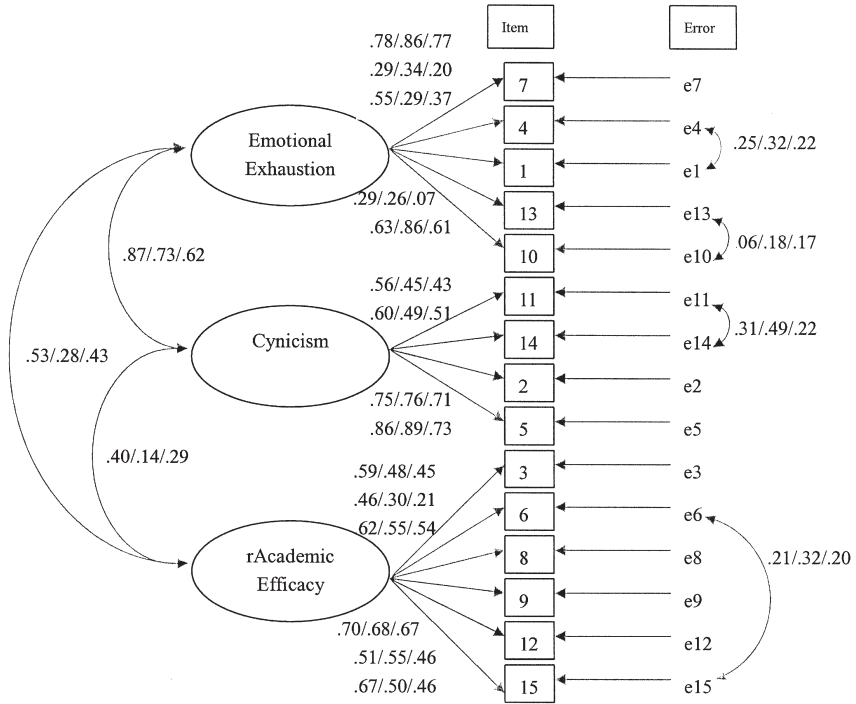
FIG. 1.   Parameter estimates in the high school, university, and nursing school samples, respectively. rAcademic Efficacy is the reverse-scored scale. All parameter estimates, $p < .001$.

score significantly lower on Emotional Exhaustion than female students ($t_{378} = -2.626$, $p < .01$).

A MANOVA including all three MBI–Student Survey scale scores simultaneously indicated that burnout scores did not differ significantly across the three student groups ($F_{2,1133} = 1.51$, ns). Furthermore, all corrections between the three scales were substantial. Correlations between Emotional Exhaustion and Cynicism ranged from .50 to .68, and t corrections between Cynicism and reverse-scored Academic Efficacy ranged from .52 to .56. Corrections between Emotional Exhaustion and reverse-scored Academic Efficacy were somewhat lower and ranged from .25 to .39. The highest correlations were observed with Cynicism, which underscores the predominant role of this burnout dimension.

Values of Cronbach coefficient alpha were not very high, but were acceptable with all values exceeding .60. They range between .60 and .69 for Emotional Exhaustion, between .68 and .80 for Cynicism, and between .65 and .77 for reverse-scored Academic Efficacy.

TABLE 4
MEANS, STANDARD DEVIATIONS, CORRELATIONS, AND CRONBACH COEFFICIENTS
ALPHA (ON THE DIAGONAL) OF THE MBI–STUDENT SURVEY SCALES

	High School (n=380)			University (n=370)			Nursing School (n=386)		
	1	2	3	1	2	3	1	2	3
Males									
M	10.60	6.89	15.00	10.23	9.92	14.84	11.00	8.12	17.75
SD	4.60	4.47	5.98	4.64	4.25	4.93	2.88	3.91	6.67
Females									
M	11.92	7.79	14.88	10.74	9.99	14.51	11.41	7.45	15.82
SD	5.08	4.63	6.43	4.58	3.81	5.29	4.52	4.20	5.77
t	−2.63*	−1.91	.19	−1.05	−.178	.62	−.25	.45	.93
p	.009	.057	.850	.295	.859	.534	.800	.653	.351
1. Emotional Exhaustion	.67			.69			.60		
2. Cynicism	.68*	.80		.62*	.77		.50*	.68	
3. Academic Efficacy (reverse-scored)	.39*	.56*	.77	.28*	.56*	.68	.25*	.52*	.65

Note.—t values indicate sex differences. *$p < .01$.

Invariance of the Factor Structure

Based on the best-fitting model from the previous analyses, six multi-group models (see Table 5) were tested using Multiple-Group analyses that include the three independent cross-validation samples. Those models assume: *all* estimates to be free (M_1); all factor loadings, correlations between factors, and correlations between errors to be invariant across the three samples (M_2); only the factor loadings to be invariant (M_3); only the correlations between the factors to be invariant (M_4); only the correlations between the errors to be invariant (M_5); the factor loadings and correlations between the error to be invariant (M_6). A series of comparisons was conducted between the five constrained models (M_{2-6}) on the one hand, and the unconstrained model (M_1) on the other hand.

TABLE 5
MULTIGROUP CONFIRMATORY FACTOR ANALYSES FOR THE HIGH SCHOOL STUDENTS
(n=380), UNIVERSITY STUDENTS (n=370), AND NURSING STUDENTS (n=386)

Model	χ^2	df	GFI	NNFI	CFI	RMSEA	$\Delta\chi^2$
M_1	644.98	249	.929	.890	.913	.037	
M_2	745.40	287	.920	.889	.899	.038	M_2–M_1=100.420†
M_3	692.18	273	.924	.885	.908	.037	M_3–M_1=47.201*
M_4	671.11	255	.927	.889	.909	.038	M_4–M_1=26.130†
M_5	667.94	257	.927	.891	.909	.038	M_5–M_1=22.961*
M_6	710.99	281	.923	.893	.905	.037	M_6–M_1=66.104†

Note.—GFI=Goodness-of-Fit Index; NNFI=The Nonnormed Fit Index; CFI=Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation; for M_{1-6}, see text. *$p < .01$, †$p < .001$.

As can be seen from Table 5, compared to the fit of the unconstrained model (M_1), the fit of all constrained models deteriorated significantly, meaning that some kind of invariance exists. The next step was to test the invariance of each factor loading, each factor correlation, and each error correlation separately and independently, using an iterative process as mentioned previously (see also Schaufeli, *et al*., 2002). The invariance of each estimate was assessed subsequently by comparing the fit of the model in which that particular estimate was constrained to be equal with the estimate that was not constrained. In case the fit deteriorated, the invariance of the next estimate was tested. However, in case the fit did not deteriorate—and the estimate was thus invariant—it was included in the next version of the model as a constrained estimate. Then the next estimate was tested, and so on. The results of this iterative process showed that: all factor loadings were invariant, except Item 1; the factor correlations of both Emotional Exhaustion with Cynicism and Emotional Exhaustion with reverse-scored Academic Efficacy were invariant; and the error correlations of e1-e4, e10-e13 and e6-e15 were invariant.

Discussion

The present study was designed in an attempt to gain more insight into the factor structure of the MBI–Student Survey in China. Using independent validation and cross-validation samples, the factorial validity of the hypothesized, three-factor correlated model with Emotional Exhaustion, Cynicism, and (reverse-scored) Academic Efficacy was shown convincingly. This result agrees with a previous study among Chinese university students (Zhang, Gan, & Zhang, 2005). Moreover, it appeared that all factor loadings except one, as well as two of the three correlations between factors and three of the four correlated error terms between items, were invariant across the three student groups. However, compared to studies from other countries, the internal consistencies of the Chinese MBI–Student Survey scales were somewhat low. Nevertheless, it is concluded that the MBI–Student Survey can be used to assess burnout among Chinese students, although it is recommended to reformulate some items (notably Items 4 and 13; see below). Also a few items could be added to each scale to increase the internal consistency.

Factorial Validity of the MBI–Student Survey

Using single sample analysis, the current study supported the robustness of the three-factor structure of the MBI–Student Survey in three student samples with different educational backgrounds. In the composite sample, the fit of the three-factor model of the MBI–Student Survey is superior to that of the one-factor model, although the fit of the former model may be further increased by allowing the four errors within subscales to

correlate. Allowing errors to correlate increases the danger of chance capitalization (MacCallum, Roznowski, & Necowitz, 1992). Therefore, the final model that included the correlated errors was cross-validated in three independent samples. Basically, this revised three-factor model was replicated in these three independent samples. Thus, as expected, the Chinese version of the MBI–Student Survey consists of three distinctive, yet related ($.25 < r < .68$), dimensions (Emotional Exhaustion, Cynicism, and reverse-scored Academic Efficacy).

The fact that two Emotional Exhaustion items (4 and 13) have relatively low factor loadings, as displayed in Fig. 1, might indicate semantic ambivalence. Probably, Item 4 ("I feel used up at the end of a day at school") is ambiguous in the Chinese context. High school students and nursing school students have to sit in their narrow seats from 6:40 a.m. to 8.30 p.m., only interrupted by a few hours for relaxation and meals. Some students may feel used up at the end of a day at school because they put their entire energy into learning, whereas others are just bored and can hardly wait to leave school. Item 4 might have two meanings, one is that studying at school all day is exhausting, and the other is that at the end of a day one is released from the strain of obligatory school activities. Item 13 ("Studying or attending a class is really a strain for me") is ambiguous too, because studying and attending classes are two different things that only partially overlap. For example, some students felt strained when engaged in study activities, but they did not feel strained when they communicated with their classmates and teachers about nonstudy related issues. Given the ambiguity of Items 4 and 13, it is recommended that Item 4 be reformulated to "Studying the whole day makes me feel used up" and Item13 into "Studying is really a strain for me."

Internal Consistency

Compared to the study of Schaufeli, *et al*. (2002), values of Cronbach coefficient alpha for the MBI–Student Survey scales in the three independent samples are relatively low and some alpha values do not meet the cutoff criterion of .70. However, the Cronbach coefficients alpha obtained for each scale were above .60, which previously served as a rule of thumb (Nunnally & Bernstein, 1994). It is nevertheless recommended that some additional items be formulated to increase the internal consistency of the MBI–Student Survey scale, for instance: "I feel that I am studying too hard" and "I feel that I am at the end of my rope" (Emotional Exhaustion); "My study is a waste of time" and "I feel disappointed about my study" (Cynicism); "I can achieve good grades" and "It is easy to understand what is being taught in class" (Academic Efficacy). Future research should reassess this slightly modified version of the Chinese MBI–Student Survey.

Sex Differences

Female high school students had higher scores on Emotional Exhaustion than male students. This might be explained by the fact that in traditional Chinese culture, females are expected to suppress their emotions, whereas for males it is allowed to discharge negative emotions, particularly when under heavy (study) pressure. This is confirmed by a recent survey that revealed that 23.4% of Chinese female high school students have suicidal ideation because of study stress, compared to 17.0% for male students (Institute of Child and Adolescent Health, 2007).

Invariance of the Factor Structure

The multigroup analyses showed that the dimensionality of the MBI–Student Survey is not entirely invariant across the three groups. All factor loadings were invariant except Item 1, "I feel emotionally drained by my studies." The same finding was observed in the case of Spanish-Dutch and Portuguese-Dutch comparisons (Schaufeli, *et al.*, 2002). The error correlations e1-e4, e10-e13, and e6-e15 were also equal across three independent samples. This means that these error correlations are not specific to the sample. In fact, some error correlations were also observed in other samples: e1-e4 among South African police officers (Storm & Rothmann, 2003), e11-e14 among three student samples (Schaufeli, *et al.*, 2002), and in a Swedish employee sample (Schutte, Toppinen, Kalimo, & Schaufeli, 2000). Correlated errors reflect common variance between items caused by overlapping item content; for instance, Item1 and Item 4 both refer to distress and tiredness as caused by one's studies, and Item 6 and Item 15 both refer to self-confidence. Thus, it seems that instead of being specific to a sample or country, these correlated errors are typical for the MBI–Student Survey.

Practical Implications

The present study shows acceptable psychometric characteristics of the Chinese version of the MBI–Student Survey and supports the soundness of the factorial structure of the survey. Hence, the MBI–Student Survey can be used to measure burnout among different types of students in China. However, it is recommended that two items be reformulated and perhaps one or two items per subscale added to increase the internal consistency.

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