

Psychometric Properties of the Copenhagen Burnout Inventory—Chinese Version

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ABSTRACT. The Copenhagen Burnout Inventory is a measurement scale that assesses the degree of burnout in the personal, work, and client domains. The aim of this study was to examine the psychometric properties of the inventory's Chinese version (CBI-C) in a sample of 312 human service workers in Hong Kong with follow-up assessment for 245 participants. The results of confirmatory factor analyses show the revised three-factor model to have an adequate fit in the baseline and cross-validation samples. The CBI-C demonstrates good degrees of internal consistency, test-retest reliability, and concurrent validity, and appears to be a valid and reliable measurement tool of burnout in the Chinese context.

Keywords: Chinese, confirmatory factor analysis, Copenhagen Burnout Inventory, psychometrics

HONG KONG, AN INTERNATIONAL METROPOLIS, is famed for long working hours, excessive workloads, and job stress (Ng, Fong, & Wang, 2009). A local large-scale survey on the work-life balance found 82.5% and 45.6% of the respondents to be suffering from excessive stress and exhaustion at work, respectively (Welford, 2008). Burnout has emerged as a major research focus in occupational health psychology. Research on the phenomenon has revealed its high prevalence rate (Arigoni, Bovier, Mermillod, Waltz, & Sappino, 2009; Evans et al., 2006) and significant association with poor health (Armon, Shirom, Shapira, & Melamed, 2008), sickness leave (Karlson et al., 2010), job dissatisfaction (ter Doest & de Jonge, 2006), and staff turnover (Ducharme, Knudsen, & Roman, 2008). To facilitate a better understanding of the degree and determinants of burnout in the working

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population, it is essential that researchers have a valid and precise measurement tool. The aim of the study reported herein was to examine the psychometric properties of a commonly used burnout measurement scale, the Copenhagen Burnout Inventory (CBI), in a Chinese population. This introduction begins with a critical review of the burnout measurement scales reported in the literature, followed by a discussion of the features of the CBI and its application in the Chinese context.

The Maslach Burnout Inventory (MBI), which was developed by Maslach and Jackson (1981), is widely adopted in burnout assessment. In the MBI, burnout is defined as a syndrome featuring emotional exhaustion, cynicism, and reduced personal efficacy. Despite its widespread use, the scale has been subject to criticism with regard to its conceptualization. As Taris et al. (2005) pointed out, for example, depersonalization is likely to be one of many coping strategies and reduced personal accomplishment an outcome of burnout, suggesting that these two dimensions may not actually reflect the central component of burnout. Cox, Tisserand, and Taris (2005) and Shirom (2005) have called for an alternative measurement scale focusing on the core concepts of fatigue and exhaustion.

In response to these criticisms of the MBI, a number of alternative measurement scales have been proposed, such as the Burnout Measure (Pines & Aronson, 1988), the Shirom-Melamed Burnout Measure (Shirom, 1989), the Oldenburg Burnout Inventory (Demerouti, Bakker, Vardakou, & Kantas, 2003), and the CBI, which was developed by Kristensen et al. (2005) in a large-scale longitudinal study in the human services field. The CBI's conceptualization unambiguously places its central focus on fatigue and exhaustion. One of its key features is the attribution of burnout to three specific domains, namely, the personal, work, and client domains. The three related subscales can be adopted separately according to the occupational context, thereby adding further flexibility to its use. In the original scale development study, the CBI demonstrated good internal consistency and intertemporal stability, together with concurrent validity with work-related psychological variables (Kristensen et al., 2005). The CBI has been translated into a number of languages and is being increasingly used worldwide. In an Australian study comparing the MBI with the CBI (Winwood & Winefield, 2004), the latter displayed excellent psychometric properties and was concluded to be an appropriate measure of burnout.

In the Chinese context, although the MBI has been adopted in the majority of burnout research, a number of researchers have opted for the CBI instead (Ng, Fong, Tsui, Au-Yeung, & Law, 2009; Tsai & Chan, 2010; Yeh, Cheng, & Chen, 2009). While Qiao and Schaufeli (2011) recently examined the factorial validity of four burnout measures, they did not include the CBI. The sole existing psychometric study of the Chinese version of the CBI (CBI-C) is that conducted by Yeh, Cheng, Chen, Hu, and Kristensen (2007), who examined its applicability among 384 employees in Taiwan. Several methodological issues with this preliminary study are worthy of note. First, as it was carried out among employees of petroleum and information technology companies, the client dimension of the

CBI-C could not be validated. Second, the study did not adopt the more systematic confirmatory factor analytic approach to verify factorial validity. Last, the study's exploratory factor analysis was based on principal component analysis, a component-based factor extraction method that has been criticized for its unrealistic assumptions and inflation of variance (Schmitt, 2011). In light of the lack of systematic psychometric research on the CBI-C, the current study set out to validate the scale by examining its psychometric properties in terms of construct validity, reliability, and concurrent validity in a sample of human service workers in Hong Kong. The study's specific hypotheses were as follows.

Hypothesis 1: The three-factor model fits the CBI-C significantly better than the one- and two-factor models.

Hypothesis 2: The CBI-C displays adequate internal consistency, test-retest reliability, and concurrent validity.

Methods

Participants

This study was part of a larger panel questionnaire survey on staff well-being. Its participants were 312 human service workers who had just been hired by a mental rehabilitation institution in Hong Kong. The participants provided written informed consent and completed a self-report questionnaire at the start of the workday. Ethical approval was obtained from a local human research ethics committee. Participants' mean age was 38.6 years ($SD = 9.9$), and the majority were women ($N = 241, 77.7\%$), married ($N = 160, 52.8\%$), and had completed high school ($N = 220, 71.4\%$). The majority were frontline support staff ($N = 258, 82.7\%$) such as personal care workers and program workers, although some were professional staff ($N = 43, 17.3\%$) such as social workers, nurses, and occupational therapists. Four months after the first survey, the participants were approached again via mail and invited to fill in the same questionnaire as a follow-up. This second wave of data was collected from 245 workers, indicating a retention rate of 78.5%.

Measures

The study's main measure was the CBI-C translated by Yeh et al. (2007). The CBI-C is a 19-item three-factor scale that assesses burnout in the personal (6 items), work (7 items), and client domains (6 items). Each item is scored on a "0–25–50–75–100" 4-point Likert scale, with higher scores denoting higher levels of burnout. The "client burnout" subscale was translated into Chinese by the first author, and then back-translated into English by a bilingual graduate student who was not involved in the study. The first and second authors then discussed the translated and back-translated versions and made revisions where necessary to

ensure translation accuracy. A pilot trial was conducted in a small group of human service workers to further verify the clarity of the language.

A battery of physical and psychosocial variables was adopted to assess the concurrent validity of the CBI-C. Physical distress was measured by the physical discomfort subscale of the Body-Mind-Spirit Well-Being Inventory (Ng, Yau, Chan, Chan, & Ho, 2005), a 14-item 10-point scale, developed in the Chinese context, that assesses the level of common bodily symptoms, with a higher score indicating greater distress. Anxiety and depression were assessed using the Chinese version of the Hospital Anxiety and Depression Scale (Leung, Wing, Kwong, Lo, & Shum, 1999), a 14-item 4-point scale that evaluates anxiety and depression levels, with higher scores indicating worse such levels. Last, a 7-item 10-point self-constructed anchored scale was used to measure respondents' perceptions of workplace social support and work commitment, with higher scores denoting greater degrees of both. Satisfactory levels of internal consistency were found for physical distress ($\alpha = .93$), anxiety ($\alpha = .83$), depression ($\alpha = .70$), workplace social support ($\alpha = .88$), and work commitment ($\alpha = .79$).

Statistical Analyses

Descriptive statistics were obtained using SPSS 20.0 with comparisons made between the sexes. The levels of burnout in the three domains between the sexes were compared using independent sample *t*-tests with Cohen's *d* used as the effect size. As an indicator of internal consistency, a Cronbach's alpha coefficient greater than .70 was considered acceptable (Nunnally & Bernstein, 1994). Test-retest reliability was evaluated by the CBI-C's intertemporal correlations over the four-month period. Concurrent validity was evaluated by its bivariate correlations with physical distress, anxiety, depression, workplace social support, and work commitment. The CBI-C was expected to be positively correlated with physical distress, anxiety, and depression and negatively correlated with workplace social support and work commitment.

To evaluate the factorial validity of the CBI-C, confirmatory factor analysis (CFA) was conducted on the covariance matrix with Mplus 6.1 (Muthen & Muthen, Los Angeles, CA) using full-information maximum likelihood to handle missing data. Preliminary analysis revealed positive skewness (range = .36–2.21) and kurtosis (range = .07–4.22) in the 19 CBI-C items, indicating deviation from a normal distribution. Taking into account the 5-point ordinal item response format, the robust weighted least square (WLSMV) estimator was adopted for model estimation (Flora & Curran, 2004; Schmitt, 2011). The model fit of the original three-factor model was evaluated on the basis of the following cutoff criteria on the fit indices: comparative fit index (CFI) ≥ 0.95 , Tucker-Lewis index (TLI) ≥ 0.95 , root mean square error of approximation (RMSEA) ≤ 0.06 , and weighted root mean square residual (WRMR) ≤ 1.0 (Hu & Bentler, 1999; Yu, 2002). Factor loadings with a magnitude of .50 or higher were classified as practically significant. The three-factor model was compared with the one- and two-factor

TABLE 1. Descriptive Statistics of the Copenhagen Burnout Inventory—Chinese Across Gender

	Total (<i>n</i> = 306) M (SD)	Female (<i>n</i> = 237) M (SD)	Male (<i>n</i> = 69) M (SD)	<i>d</i>
Personal burnout	27.7 (19.0)	28.0 (19.4)	26.5 (17.6)	0.03
Scores \geq 50	14.3%	14.8%	13.0%	
Work burnout	22.1 (16.0)	22.2 (16.0)	22.0 (16.4)	0.00
Scores \geq 50	9.2%	10.2%	5.8%	
Client burnout	17.3 (14.3)	18.3 (14.5)	14.5 (13.1)	0.11
Scores \geq 50	4.9%	6.0%	1.5%	

Note. *d* = Cohen *d* effect size based on comparison between gender; Proportions of participants in the scoring range are shown in italics.

models using chi square difference tests via the DIFFTEST option in Mplus. For the two-factor model, the first 13 items (those covering the personal and work domains) were specified to load onto the first factor, whereas the remaining six loaded onto the second. The modification indices (MI) and standardized expected parameter change (Std EPC) were taken into account to adjust for potential model misspecification. To confirm the validity of the resulting factor structure, a cross-validation test was performed on the four-month follow-up data. The significance level was fixed at .01.

Results

Descriptive Statistics

Table 1 displays the CBI-C descriptive statistics by sex. The mean scores (*SD*) for personal, work, and client burnout were 27.7 (*SD* = 19.0), 22.1 (16.0), and 17.3 (14.3), respectively. Using a score of 50 or above as the criterion for a high degree of burnout (Borritz, Rugulies, Christensen, Villadsen, & Kristensen, 2006), 14.3%, 9.2%, and 4.9% of the participants showed a high level of burnout in the personal, work, and client domains, respectively. Independent sample *t*-tests indicated no significant differences between the sexes in personal burnout (Cohen *d* = 0.03, *t* = 0.57, *p* > .05), work burnout (Cohen *d* = 0.00, *t* = 0.07, *p* > .05), or client burnout (Cohen *d* = 0.11, *t* = 1.95, *p* > .05).

Factorial Validity

Table 2 presents the CFA results for the CBI-C. The original three-factor model displayed a marginally acceptable fit to the data, with CFI and TLI > .95 but RMSEA > .08 and WRMR > 1.0. In comparison with the three-factor model,

TABLE 2. Goodness of Fit Indices of the Factor Models of the Copenhagen Burnout Inventory—Chinese

Step	Model description	χ^2	df	CFI	TLI	RMSEA (90% CI)	WRMR	Model contrast	$MD\Delta\chi^2$ (df)
Baseline ($N = 312$)									
1	Original 3-factor	471.27*	149	.969	.964	.083 (.075–.092)	1.177		
2	1-factor	784.28*	152	.939	.931	.115 (.108–.124)	1.608	2 VS 1	130.27 (3)*
3	2-factor	541.79*	151	.962	.957	.091 (.083–.099)	1.285	3 VS 1	46.44 (2)*
4	Revised 3-factor	316.28*	146	.984	.981	.061 (.052–.070)	.910	1 VS 4	96.39 (3)*
4-month follow up ($N = 245$)									
5	Revised 3-factor	354.92*	146	.986	.983	.076 (.066–.087)	.891		

Note. χ^2 : chi-square from robust weighted least square estimation; df: degree of freedom; CFI: Comparative fit index; TLI: Tucker-Lewis index; RMSEA (90% CI): Root mean square error of approximation (90% Confidence Interval); WRMR: Weighted root mean square residuals; $MD\Delta\chi^2$: Change in χ^2 relative to the stated model calculated from Mplus DIFFTEST function. The revised 3-factor model incorporated 3 error covariances between adjacent items.
* $p < .01$.

TABLE 3. Internal consistency and Concurrent Validity of the Copenhagen Burnout Inventory ($N = 306$)

	Personal burnout	Work burnout	Client burnout
Cronbach's alpha	.91	.84	.78
Age	-.26*	-.21*	-.11
Physical distress	.64*	.65*	.42*
Anxiety	.69*	.70*	.51*
Depression	.61*	.61*	.41*
Workplace social support	-.46*	-.48*	-.31*
Work commitment	-.38*	-.33*	-.25*

Note. * $p < 0.01$.

significant chi-square changes were found in the one-factor ($\Delta\chi^2 = 130.27$, $df = 3$) and two-factor models ($\Delta\chi^2 = 46.44$, $df = 2$). These two alternative models displayed a lower CFI and TLI and a higher RMSEA and WRMR. Thus, the results support Hypothesis 1. Examination of the MI and Std EPC suggested the addition of error covariances between three adjacent pairs of items, namely, items 14 and 15 (MI = 91.23, Std EPC = .734), 11 and 12 (MI = 43.55, Std EPC = .651), and 1 and 2 (MI = 34.56, Std EPC = .572).

This revised three-factor model exhibited a satisfactory fit, with CFI and TLI > .95, RMSEA = .08, and WRMR < 1.0, in addition to significant chi-square improvements over the original three-factor model ($\Delta\chi^2 = 96.39$, $df = 3$). Furthermore, in the revised three-factor model, all 19 items loaded significantly onto their respective factors and all of the factor loadings exceeded .50 with the exception of item 13. The three dimensions of burnout were significantly and strongly correlated ($r = .73 - .95$, $p < .01$). Last, the cross-validation test on the four-month follow-up sample showed the revised three-factor model to provide similar fit indices as in the baseline sample, with a slightly higher CFI, TLI, and RMSEA and a lower WRMR.

Reliability and Concurrent Validity

Table 3 shows the internal consistency and bivariate correlations of the CBI-C with other variables. The Cronbach's alpha coefficients were .91, .84, and .78 for personal, work, and client burnout, respectively, and strong correlations were found for burnout in the three domains ($r = .60 - .63$, $p < .01$) across the two surveys. In terms of concurrent validity, significant correlations were found between the CBI-C and other variables. For example, age was found to be negatively and weakly associated with personal ($r = -.26$, $p < .01$) and work burnout ($r = -.21$, $p < .01$) but not with client burnout ($r = -.11$, $p > .05$). Positive and moderate to

strong correlations were found between the CBI-C and physical distress ($r = .42 - .65, p < .01$), anxiety ($r = .51 - .70, p < .01$), and depression ($r = .41 - .61, p < .01$), respectively, whereas negative and weak to moderate correlations were found between the CBI-C and workplace social support ($r = -.31$ to $-.48, p < .01$) and work commitment ($r = -.25$ to $-.38, p < .01$). These findings support Hypothesis 2.

Discussion

This is the first systematic study to evaluate the psychometric properties of the CBI in the Chinese context. The revised three-factor CBI-C model was found to provide an adequate fit to the data, corroborating the scale's underlying three-dimensional nature in a Chinese population. Nevertheless, several issues are worthy of further deliberation. First, consistent with previous research (Kristensen et al., 2005; Yeh et al., 2007), personal and work burnout were found to be highly correlated in this study, suggesting a substantial overlap between these two domains. The former is a generic measure of the general status of fatigue and exhaustion, whereas the latter assesses the degree of work-related fatigue and exhaustion. As this study was carried out among full-time human service staff working more than 40 hours per week, work represents an essential part of their lives. Thus it may have been difficult for participants to differentiate their experience at work from that in other domains of their lives, thereby producing similar burnout scores across different domains. However, as Yeh et al. (2007) pointed out, it is theoretically possible for people to score high in one domain and low in the other. For instance, workaholics with a low level of work burnout may feel exhausted by their personal life. In the present study, the three-factor model displayed a significantly better fit than either the one-factor or two-factor model, supporting differentiation of the three domains of burnout.

The second issue relates to the low factor loading for item 13 on the work burnout subscale. As this item is the sole reverse item on the scale, its low factor loading may be attributable to stereotypical responses to questions in the same direction. Deleting item 13 yielded similar results for the underlying factor structure. To facilitate comparison of burnout scores across cultures or contexts, we opt for retaining the item in future uses of the CBI-C. The third issue concerns the three error covariances in the revised three-factor model. Specification of these covariances between adjacent item pairs is most likely the result of similarity in item wordings or an overlap in item content. Although model modification resulted in a significant improvement in model fit, caution is warranted owing to the post-hoc nature of the procedure (Schmitt, 2011) and the possibility that the results were due to chance. However, the revised model was largely replicated in the follow-up sample, providing empirical support for the three-factor structure.

The three dimensions of burnout exhibited an adequate level of internal consistency ($\alpha > .70$), and the substantial test-retest reliability over the four-month period appears to suggest the inventory's temporal stability. However, as Kristensen et al. (2005) noted, the levels of burnout are not stable traits but may undergo systematic change over time. Future longitudinal studies should explore the changing trajectory of burnout to provide a clearer picture of the phenomenon and potential underlying organizational changes. Consistent with the previous literature (Maslach, Schaufeli, & Leiter, 2001; Schaufeli & Enzmann, 1998), burnout levels in this study did not differ between the sexes, although younger workers exhibited slightly higher such levels in the personal and work domains. The CBI-C was associated in the expected directions with a number of physical and psychosocial factors, namely, physical distress, anxiety, depression, workplace social support, and work commitment, lending support to the scale's concurrent validity.

Despite the similarities with existing research in terms of reliability and concurrent validity, an interesting finding in this study was the mean levels of burnout identified. The mean scores for personal, work, and client burnout (27.7, 22.1, and 17.3) were significantly lower than the normative scores in the original scale development study (35.9, 33.0, and 30.9) carried out by Kristensen et al. (2005) or the pilot validation study (45.0 and 36.7) carried out by Yeh et al. (2007). These relatively low levels of burnout are likely attributable to the study sample comprising human service workers just starting out in the field, and merely reflecting baseline levels of burnout. Potential differences in work conditions and cultural context limit explicit comparisons between our findings and those of previous research.

Several limitations should be noted with regarding to this study. First, the study sample was recruited from a specific institution in the human service field. The potential for sampling bias means that the results may not be generalizable to other working populations. Future studies should test the CBI-C in other populations such as the nonworking population or finance professionals. Second, the relatively small sample size could limit the statistical power of our analyses. In particular, the small number of male participants ($N = 69$) prevented further tests on the scale's measurement invariance across the sexes, an important measurement property for valid group comparison. Furthermore, the self-report nature of the measurement tools may have introduced bias owing to common method variance.

In conclusion, this study provides supportive evidence of the adequate psychometric properties of the Chinese version of the Copenhagen Burnout Inventory. The CBI's exclusive focus on fatigue and exhaustion is consistent with its clear definition of burnout, which, in turn, facilitates the precise measurement of burnout and future intervention strategies. The use of the CBI-C as a flexible and versatile tool is recommended in future research assessing the degree of burnout in Chinese populations

AUTHOR NOTES

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REFERENCES

- Arigoni, F., Bovier, P. A., Mermillod, B., Waltz, P., & Sappino, A. P. (2009). Prevalence of burnout among Swiss cancer clinicians, paediatricians and general practitioners: Who are most at risk? *Supportive Care in Cancer*, 17(1), 75–81. doi: 10.1007/s00520-008-0465-6
- Armon, G., Shirom, A., Shapira, I., & Melamed, S. (2008). On the nature of burnout-insomnia relationships: A prospective study of employed adults. *Journal of Psychosomatic Research*, 65(1), 5–12. doi: 10.1016/j.jpsychores.2008.01.012
- Borritz, M., Rugulies, R., Christensen, K. B., Villadsen, E., & Kristensen, T. S. (2006). Burnout as a predictor of self-reported sickness absence among human service workers: prospective findings from three year follow up of the PUMA study. *Occupational and Environmental Medicine*, 63(2), 98–106. doi: 10.1136/oem.2004.019364
- Cox, T., Tisserand, M., & Taris, T. (2005). The conceptualization and measurement of burnout: Questions and directions. *Work and Stress*, 19(3), 187–191. doi: 10.1080/02678370500387109
- Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments - A multitrait-multimethod analysis. *European Journal of Psychological Assessment*, 19(1), 12–23. doi: 10.1027//1015-5759.19.1.12
- Ducharme, L. J., Knudsen, H. K., & Roman, P. M. (2008). Emotional exhaustion and turnover intention in human service occupations: The protective role of coworker support. *Sociological Spectrum*, 28(1), 81–104. doi: 10.1080/02732170701675268
- Evans, S., Huxley, P., Gately, C., Webber, M., Mears, A., Pajak, S., . . . Katona, C. (2006). Mental health, burnout and job satisfaction among mental health social workers in England and Wales. *British Journal of Psychiatry*, 188, 75–80.
- 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(4), 466–491. doi: 10.1037/1082-989x.9.4.466
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. doi: 10.1080/10705519909540118
- Karlson, B., Jonsson, P., Palsson, B., Abjornsson, G., Malmberg, B., Larsson, B., & Osterberg, K. (2010). Return to work after work after a workplace-oriented intervention for patients on sick-leave for burnout—A prospective controlled study. *BMC Public Health*, 10, 1–10. doi: 30110.1186/1471-2458-10-301
- Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work and Stress*, 19(3), 192–207. doi: 10.1080/02678370500297720

- Leung, C. M., Wing, Y. K., Kwong, P. K., Lo, A., & Shum, K. (1999). Validation of the Chinese-Cantonese version of the Hospital Anxiety and Depression Scale and comparison with the Hamilton Rating Scale of Depression. *Acta Psychiatrica Scandinavica*, 100(6), 456–461.
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2(2), 99–113.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397–422.
- Ng, S. M., Fong, T. C. T., Tsui, E. Y. L., Au-Yeung, F. S. W., & Law, S. K. W. (2009). Validation of the Chinese version of Underwood's daily spiritual experience scale—transcending cultural boundaries? *International Journal of Behavioral Medicine*, 16(2), 91–97. doi: 10.1007/s12529-009-9045-5
- Ng, S. M., Fong, T. C. T., & Wang, X. L. (2009). A Hong Kong perspective. In N. Thompson & J. Bates (Eds.), *Promoting workplace well-being: A critical approach* (pp. 174–188). Basingstoke Palgrave Macmillan.
- Ng, S. M., Yau, J. K. Y., Chan, C. L. W., Chan, C. H. Y., & Ho, D. Y. F. (2005). The measurement of Body-Mind-Spirit well-being: Toward multidimensionality and transcultural applicability. *Social Work in Health Care*, 41(1), 33–52. doi: 10.1300/J010v41n01_03
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Pines, A., & Aronson, E. (1988). *Career burnout: Causes and cures*. New York, NY: Free Press.
- Qiao, H., & Schaufeli, W. B. (2011). The convergent validity of four burnout measures in a Chinese sample: A confirmatory factor-analytic approach. *Applied Psychology—An International Review*, 60(1), 87–111. doi: 10.1111/j.1464-0597.2010.00428.x
- Schaufeli, W. B., & Enzmann, D. (1998). *The burnout companion to study and practice: A critical analysis*. Washington, DC: Taylor & Francis.
- Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, 29(4), 304–321. doi: 10.1177/0734282911406653
- Shirom, A. (1989). Burnout in work organizations. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology 1989* (pp. 25–48). Oxford, England: John Wiley & Sons.
- Shirom, A. (2005). Reflections on the study of burnout. *Work and Stress*, 19(3), 263–270. doi: 10.1080/02678370500376649
- Taris, T. W., Le Blanc, P. M., Schaufeli, W. B., & Schreurs, P. J. G. (2005). Are there causal relationships between the dimensions of the Maslach Burnout Inventory? A review and two longitudinal tests. *Work and Stress*, 19(3), 238–255. doi: 10.1080/02678370500270453
- ter Doest, L., & de Jonge, J. (2006). Testing causal models of job characteristics and employee well-being: A replication study using cross-lagged structural equation modelling. *Journal of Occupational and Organizational Psychology*, 79, 499–507. doi: 10.1348/096317905x55271
- Tsai, F. J., & Chan, C. C. (2010). Occupational stress and burnout of judges and procurators. *International Archives of Occupational and Environmental Health*, 83(2), 133–142. doi: 10.1007/s00420-009-0454-1
- Welford, R. (2008). *Work life balance in Hong Kong: Survey results*. Hong Kong: The University of Hong Kong and CSR Asia.
- Winwood, P. C., & Winefield, A. H. (2004). Comparing two measures of burnout among dentists in Australia. *International Journal of Stress Management*, 11(3), 282–289.

- Yeh, W. Y., Cheng, Y. W., & Chen, C. J. (2009). Social patterns of pay systems and their associations with psychosocial job characteristics and burnout among paid employees in Taiwan. *Social Science and Medicine*, 68(8), 1407–1415. doi: 10.1016/j.socscimed.2009.01.031
- Yeh, W. Y., Cheng, Y., Chen, C. J., Hu, P. Y., & Kristensen, T. S. (2007). Psychometric properties of the Chinese version of Copenhagen burnout inventory among employees in two companies in Taiwan. *International Journal of Behavioral Medicine*, 14(3), 126–133.
- Yu, C. Y. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes*. Los Angeles, University of California

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