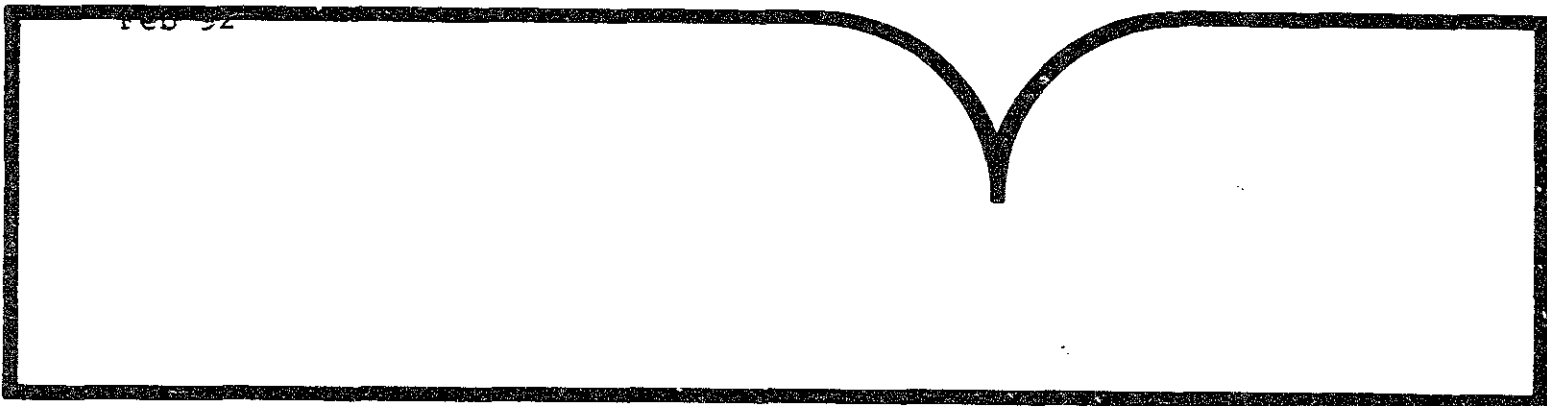


PB92-162262

Confirmatory Factor Analysis of Burnout Dimensions
Correlations with Job Stressors and Aspects of Social
Support and Job Satisfaction

(U.S.) Federal Aviation Administration, Washington, DC



U.S. Department of Commerce
National Technical Information Service
NTIS

DOT/FAA/AM-92/7

Office of Aviation Medicine
Washington, D.C. 20591

Confirmatory Factor Analysis of Burnout Dimensions: Correlations with Job Stressors and Aspects of Social Support and Job Satisfaction

Lendell G. Nye
L.A. Witt
David Schroeder

Civil Aeromedical Institute
Federal Aviation Administration
Oklahoma City, Oklahoma 73125

February 1992

Final Report

This document is available to the public
through the National Technical Information
Service, Springfield, Virginia 22161.



U.S. Department
of Transportation
**Federal Aviation
Administration**

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

1. Report No. DOT/FAA/AM-92/7	2 PB92-162262	3. Recipient's Catalog No.	
4. Title and Subtitle CONFIRMATORY FACTOR ANALYSIS OF BURNOUT DIMENSIONS: CORRELATIONS WITH JOB STRESSORS AND ASPECTS OF SOCIAL SUPPORT AND JOB SATISFACTION		5. Report Date February 1992	6. Performing Organization Code
7. Author(s) Lendell G. Nye, L. A. Witt, and David J. Schroeder		8. Performing Organization Report No.	
9. Performing Organization Name and Address FAA Civil Aeromedical Institute P. O. Box 25082 Oklahoma City, OK 73125		10. Work Unit No. (TRAIS)	11. Contract or Grant No.
12. Sponsoring Agency Name and Address Office of Aviation Medicine Federal Aviation Administration 800 Independence Avenue, S.W. Washington, D.C. 20591		13. Type of Report and Period Covered	
14. Sponsoring Agency Code			
15. Supplementary Notes This work was performed under task AM-C-91-HRR-122.			
16. Abstract This study examined the dimensionality and construct validity of Golembiewski, Munzenrider, and Stevenson (1986) revision of the Maslach and Jackson (1981) Maslach Burnout Inventory (MBI). Results of confirmatory factor analyses conducted on data collected from 357 FAA employees in a technical, safety-related occupation provided support for a 3-factor, correlated model of burnout. The results suggest that the three factors (emotional exhaustion, depersonalization, and personal accomplishment) were differentially correlated with organizational phenomena of interest. These findings extend the literature beyond analyses on human service-type workers and suggest the utility of developing and implementing different strategies for management interventions to respond to different manifestations of employee burnout.			
17. Key Words Burnout Job Stress Social Support Job Satisfaction		18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Virginia 22161	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 9	22. Price

CONFIRMATORY FACTOR ANALYSIS OF BURNOUT DIMENSIONS: CORRELATIONS WITH JOB STRESSORS AND ASPECTS OF SOCIAL SUPPORT AND JOB SATISFACTION

Employee burnout remains both a significant impediment to productivity and a contributor to high health costs for employers. Congruent with its importance, burnout has received considerable empirical attention. Despite the rather substantial size of the burnout literature, a number of issues remain in need of resolution, including its measurement, differential relationships between burnout dimensions and organizational criteria of interest, and the applicability of the burnout construct to technical and other work populations not involved in human services. The present study examined the dimensionality and construct validity of Golembiewski, Munzenrider, and Stevenson's (1986) revision of the most commonly cited burnout measure, namely the Maslach and Jackson (1981) Maslach Burnout Inventory (MBI). The MBI features three burnout dimensions: emotional exhaustion, depersonalization, and a lack of personal accomplishment.

Most validation studies have involved samples of human services workers or their supervisors and managers (e.g., Lee & Ashforth, 1990; Gold, Bachelor, & Michael, 1989). For example, Lee and Ashforth (1990) compared several alternative models of the MBI factor structure and found that a correlated (oblique) 3-factor model provided the best solution and met the conventional goodness-of-fit criteria for an acceptable model. Also the emotional exhaustion and depersonalization factors were highly correlated. Because of our concern for the generalizability of their findings, one purpose of the present study was to evaluate the dimensionality of the MBI on data collected from workers in a technical, safety-related occupation.

A second purpose was to further assess the conceptual nature of burnout. According to Leiter (1989), emotional exhaustion involves self-reported psychological and physiological strain as the individual's initial response to stress. This is followed by a coping response of alienation from the clients or co-workers (depersonalization)

and finally a reduced self-evaluation of adequacy (personal accomplishment). However, studies examining relationships between job attitudes and burnout have yielded mixed results. For example, Lee and Ashforth (1990) reported that MBI burnout dimensions were related to measures of psychological and physiological strain, helplessness, and appraisals of performance. Russell, Altmaier, and Van Velzen (1987) found that supervisor support was related to all three MBI dimensions among school teachers. Unlike Russell et al. (1987), Jackson, Turner, and Brief (1987) found differential relationships among public service lawyers between the burnout dimensions and various organizational issues: depersonalization was related to decision-making policies, personal accomplishment was associated with supervisory support, and emotional exhaustion was related to workload.

To clarify and extend the literature, we sought to assess the dimensionality of the MBI and examine the relationships of MBI burnout dimensions with measures of job satisfaction, social support, and workload-related stress. Following Lee and Ashforth (1990), we expected to find support for a 3-factor, correlated model. Based on the Jackson et al. (1987) findings, we hypothesized that emotional exhaustion would be most strongly associated with workload-related stressors, that personal accomplishment would be most strongly related to social support, and that depersonalization would be most strongly correlated with supervisory/management practices as a source of stress. In addition, we hypothesized that emotional exhaustion would be related to "bounceback" burnout, and that personal accomplishment would be associated with job satisfaction. Confirmation of these hypotheses would demonstrate support for the construct validity of the 3-dimension model of the MBI and suggest different management applications for using MBI scores as a basis for interventions.

METHOD

Subjects and Procedure

Subjects were 357 employees of the FAA of which 22.8% were women and 85.1% were non-supervisors. Subjects voluntarily participated in anonymous small group administrations.

Measures

Social support was measured by the 6-item ($M = 12.2$, $SD = 4.78$, $\alpha = .92$) supervisor support and the 3-item ($M = 6.43$, $SD = 1.94$, $\alpha = .79$) work group support subscales of the House (1981) social support measure. Higher scores reflect greater levels of support.

Overall employee stress was measured by the Schroeder, Thomas, Weltin, Vandeventer, Collins, Dollar and Ritchie (1986) 13-item scale of self-reported frequency of stressors ($M = 34.65$, $SD = 7.8$, $\alpha = .79$). Items were presented as responses to the question, "How often have the following been a source of stress to you during the past six months?" on a five-point, Likert-type scale (5 = always, 4 = frequently, 3 = occasionally, 2 = infrequently, 1 = never). Three subscales were specifically examined because of their relevance to the safety-related technical workforce. Automation-related stress was assessed by two items ($M = 4.62$, $SD = 1.87$): "increased automation entering the workplace" and "delays in implementation of automation." Workload-related stress was measured by three items ($M = 9.22$, $SD = 2.58$, $\alpha = .77$), namely "too much work to do," "insufficient time to do the job," and "lack of resources necessary to do the job." Stress resulting from supervisory decision-making and policies was assessed by one item, "supervisory/management practices" ($M = 3.38$, $SD = 1.12$). Higher scores reflect greater levels of stress.

The 4-item ($M = 9.49$, $SD = 3.43$, $\alpha = .80$) Rose, Jenkins, and Hurst (1978) burnout-bounceback index was specifically designed for measuring burnout among workers in safety-related occupations. The scale assesses the individual's experience of burnout and the ability to "bounceback" to work after some time off.

Higher scores reflect greater levels of burnout.

The 18-item work satisfaction scale of the Smith, Kendall, and Hulin (1969) Job Descriptive Index (JDI, $M = 30.40$, $SD = 11.61$, $\alpha = .83$) was included as a measure of job satisfaction. In addition, global job satisfaction was measured by responses to one item presented on a five-point Likert-type scale (1 = very dissatisfied to 5 = very satisfied), "Overall, how satisfied are you with your job?" ($M = 3.56$, $SD = 1.19$). Higher scores reflect greater feelings of job satisfaction.

Because of its greater ease of scoring, we used the Golembiewski et al. (1986) 23-item, three subscale (emotional exhaustion: $M = 22.65$, $SD = 10.09$, $\alpha = .87$; depersonalization: $M = 19.52$, $SD = 7.85$; $\alpha = .71$); personal accomplishment: $M = 35.88$, $SD = 7.57$; $\alpha = .69$) revision of the Maslach and Jackson (1981) MBI. Higher scores on the emotional exhaustion and depersonalization subscales reflect greater burnout, while higher scores on the personal accomplishment subscale indicate less burnout.

A series of confirmatory factor analyses (CFA) were conducted using the maximum likelihood method (LISREL VI; Joreskog & Sorbom, 1986). The first procedure involved a preliminary step of developing three observed indicators for each of the MBI burnout subscales following the methods described by Brooke, Russell, and Price (1988). For example, a CFA of the eight items comprising the depersonalization subscale provided the factor loadings which were used to assign items based on the criterion of the highest loading with the lowest loading, the item with the next highest loading with the next lowest loading, etc. Thus, the result was nine observed indicators of three latent measures of the MBI manifestations of burnout. This approach provided greater factor reliability for the composite indicators, compared to using the 23 individual items of the MBI (Bentler & Chou, 1987). A major advantage of analyzing latent variables was the elimination of the effects of random measurement error, resulting in a less biased estimate of the correlations between the burnout dimensions and the measures of stress, supervisory support, and job satisfaction.

The goodness-of-fit statistics used by Lee and Ashforth (1990) were applied to several models. The goodness-of-fit index (GFI), adjusted goodness-of-fit (AGFI), root-mean-square residual (RMSR), the normed-fit index (NFI), and parsimonious-fit index (PFI) were computed. The NFI (Bentler & Bonett, 1980) is a goodness-of-fit measure based on the difference between the chi-square of a null model (the MBI indicators defined as not having a factor structure) and the chi-square of the proposed factor model, divided by the chi-square of the null model. The PFI (James, Mulaik, & Brett, 1982) is a modification of the NFI calculated by multiplying the NFI by the ratio of the degrees of freedom of the proposed model compared to the degrees of freedom of the null model. An NFI value of .90 or greater has been interpreted as representing an excellent fit of the data if accompanied by little reduction in parsimony.

The relative adequacy of six models was tested using the chi-square difference test (Bentler & Bonett, 1980), which involved subtracting chi-square values between two alternative solutions and using the difference in degrees of freedom to determine whether or not the improvement was significant. The null model tested the idea that the MBI indicators did not have an underlying factor structure. The 1-factor model represented the idea that burnout was best understood as a unidimensional construct. The orthogonal and oblique 2-factor models tested if emotional exhaustion and depersonalization comprised single constructs as found in exploratory factor analyses reported by Brookings, Bolton, Brown, and McEnvoy (1985) and Dignam, Barrera, and West (1986). The correlated and uncorrelated 3-factor models examined the goodness-of-fit of the MBI representation of burnout. Finally, specific and overall job-related stress indicators, supervisory and work group support measures, overall job satisfaction, the JDI satisfaction with the work itself scale, and the bounceback-burnout scale were correlated with the maximum likelihood latent factors of MBI burnout computed from the correlated 3-factor model.

As shown in Table 1, the 3-factor correlated model (NFI = .930) was the only one with a value of .90 or greater on the NFI criterion. The PFI of .620 indicated that this model was essentially as parsimonious as any of the others. Also, based on chi-square difference tests, this model represented a significant improvement when compared to the alternatives. For example, when compared with Model 5 (three orthogonal factors) the resulting significance in improvement in the fit of data-to-model was represented by $\chi^2(3) = 146.60, p < .001$.

The likelihood of intercorrelations among the burnout dimensions was further demonstrated by the results of the chi-square difference test between Model 5 and Model 4 (two correlated factors). Contrary to Lee and Ashforth's (1990) findings, the 2-factor correlated model was superior to 3-factor orthogonal model ($\chi^2(1) = 38.61, p < .001$).

The results of the CFA of the MBI burnout dimensions of the 3-factor, correlated model (Model 6 in Table 1) are presented in Table 2. The maximum likelihood loadings were higher on the emotional exhaustion factor (above .85) compared with the loadings on the other factors. Emotional exhaustion was related ($p < .001$) to both depersonalization ($r = .65$) and personal accomplishment ($r = -.27$). Personal accomplishment and depersonalization ($r = -.44, p < .001$) were also significantly related.

The LISREL generated estimates for the correlations with the burnout factors are shown in Table 3. Clearly, the job-related stress measures -- overall stress frequency ($r = .53$), workload stress ($r = .72$), and stress related to automation ($r = .34$) -- were significantly ($p < .01$) and differentially reflected in emotional exhaustion, compared with the depersonalization and personal accomplishment dimensions of burnout. Higher reported frequency of the experience of these job-related stressors was positively correlated with greater expressions of personal accomplishment. Perceived stress related to super-

visory/management practices was associated only with the depersonalization (i.e., alienation from co-workers) dimension.

The overall job satisfaction item and JDI work satisfaction scale were moderately correlated ($r = -.43$ and $r = -.46$, $p < .01$) with emotional exhaustion. However, the job satisfaction indicators were reflected positively in higher levels of personal accomplishment (overall job satisfaction: $r = .33$ and JDI work satisfaction: $r = .28$, $p < .01$). Social support from both the supervisor and work group sources was significantly related ($r = .28$ and $r = .27$, $p < .01$) to perceptions of personal accomplishment. Also, supervisory support correlated negatively and significantly ($r = -.21$, $p < .01$) with emotional exhaustion.

TABLE 1. Goodness-of-fit Indices for Burnout Models and Chi-Square Difference

Model	χ^2	df	GFI	AGFI	RMSR	NFI	PFI
1. Null	1,324.10	36	.464	.330	.340	—	—
2. 1 factor	335.26	27	.795	.658	.135	.747	.560
3. 2 factors, orthogonal	220.85	27	.870	.783	.155	.833	.625
4. 2 factors, correlated	201.51	26	.873	.780	.111	.848	.612
5. 3 factors, orthogonal	239.12	27	.872	.786	.222	.819	.614
6. 3 factors, correlated	92.52	24	.945	.898	.080	.930	.620
Chi-Square Difference Tests:							
Model 3 with Model 4: $\chi^2(1) = 19.34$, $p < .001$							
Model 5 with Model 4: $\chi^2(1) = 37.61$, $p < .001$							
Model 5 with Model 6: $\chi^2(3) = 146.60$, $p < .001$							
Note: GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; RMSR = root-mean-square residual; NFI = normed-fit ratio of chi-square improvement relative to the null model; PFI = parsimonious-fit index.							

TABLE 2. Confirmatory Factor Analysis of Burnout Dimensions for the 3-factor Correlated Model: Maximum Likelihood Loadings

	EMEX	DEPERS	PERAC
EMEX1	.901		
EMEX2	.873		
EMEX3	.854		
DEPERS1		.608	
DEPERS2		.730	
DEPERS3		.681	
PERAC1			.663
PERAC2			.708
PERAC3			.631

Note: EMEX = emotional exhaustion; DEPERS = depersonalization; PERAC = personal accomplishment. Each burnout dimension was divided into three indicators (e.g. PERAC1, PERAC2, PERAC3) following procedures outlined by Brooke et al. (1988).

TABLE 3. LISREL Estimates of Correlations with MBI Burnout Dimensions

	EMEX	DEPERS	PERAC
Frequency of Stress			
Total (Overall) Stress	.53	ns	.19
Workload-Related	.72	ns	.20
Automation-Related	.34	ns	.23
Supv.-Mgt. Practices	ns	.22	ns
Burnout-Bounceback Index	.64	ns	ns
Support Subscales			
Supervisory	-.21	ns	.28
Work Group	ns	ns	.27
Job Satisfaction			
Overall job satisfaction	-.43	ns	.33
JDI work satisfaction	-.46	ns	.28

Note: EMEX = emotional exhaustion; DEPERS = depersonalization; PERAC = personal accomplishment. Higher personal accomplishment reflects a lower burnout level. ns = $p > .01$.

DISCUSSION

We found discriminant validity for the burnout dimensions of emotional exhaustion, deper-

sonalization, and personal accomplishment. Consistent with Lee and Ashforth's (1990) results, CFA results clearly supported the notion that burnout is best defined by three distinct, but intercorrelated constructs. Consistent with and extending Jackson et al.'s (1987) findings, self-reported measures of stress, social support, and job satisfaction were differentially correlated with the burnout factors: Social support from the supervisor and work group was related to personal accomplishment; workload-related stress was most highly associated with emotional exhaustion; and depersonalization was related to supervisory/management practices. Contrary to our expectations, job satisfaction scores were most strongly related to emotional exhaustion. Further research is needed to explore this finding.

The finding that the job stressors (except supervisory/management practices) were more highly correlated with emotional exhaustion than depersonalization supports Leiter's (1989) conceptualization of burnout. He argued that job stressors, especially the chronic ones, are experienced initially as emotional exhaustion. The positive relationship between emotional exhaustion and depersonalization suggests that the job stressors may have indirect effects on depersonalization through emotional exhaustion.

The present study has extended the literature by: (a) confirming the 3-factor, correlated structure of the MBI on data collected from safety-related technical workers, and (b) demonstrating differential relationships between the burnout dimensions and organizational issues. These findings suggest the utility of developing and implementing different strategies for management interventions to respond to different manifestations of employee burnout. For example, social support from members of the work group may help reduce the negative effects of a lack of personal accomplishment, but may not reduce emotional exhaustion. Moreover, the relationship between supervisor/management practices as a source of stress and depersonalization suggests possible opportunities for interventions such as participation in decision-making.

In addition, our results provide some evidence

of construct validity of the Golembiewski et al. (1986) version of the MBI. Given this demonstration of validity, and, as it is somewhat easier to administer and score than the original version, we suggest that it can be effectively and efficiently used in organizations.

REFERENCES

- Bentler, P.M., & Bonett, D.G. (1980). Significance test and goodness of fit in the analysis of covariance structure. *Psychological Bulletin*, 88, 588-606.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods and Research*, 16, 78-117.
- Brooke, P. P., Jr., Russell, D. W., & Price J. L. (1988). Discriminant validity of measures of job satisfaction, job involvement, and organizational commitment. *Journal of Applied Psychology*, 73, 139-145.
- Brookings, J.B., Bolton, B., Brown, C.E., & McEnvoy, A. (1985). Self-reported job burnout among female human service professionals. *Journal of Occupational Behavior*, 6, 143-150.
- Dignam, J.T., Barrera, M., Jr., & West, S.G. (1986). Occupational stress, social support, and burnout among correctional officers. *American Journal of Community Psychology*, 14, 177-193.
- Gold, Y., Bachelor, P., & Michael, W. B. (1989). The dimensionality of a modified form of the Maslach Burnout Inventory for university students in a teaching training program. *Educational and Psychological Measurement*, 49, 549-561.
- Golembiewski, R.T., Munzenrider, R.F., & Stevenson, J.C. (1986). *Stress in organizations: Toward a phase model of burnout*. New York: Praeger.
- House, J. S. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.

- Jackson, S.E., Turner, J.A., & Brief, A.P. (1987). Correlates of burnout among public service lawyers. *Journal of Occupational Behavior*, 8, 339-349.
- James, L. R., Mulaik, S. A., & Brett, J. M. (1982). *Causal analysis: Assumptions, models, and data*. Beverly Hills, CA: Sage.
- Joreskog, K. G. & Sorbom, D. (1986). *LISREL VI: Analysis of linear structural relationships by the maximum likelihood method (4th edition)*. Mooresville, IN: Scientific Software.
- Lee, R. T., & Ashforth, B. E. (1990). On the meaning of Maslach's three dimensions of burnout. *Journal of Applied Psychology*, 75, 743-747.
- Leiter, M. P. (1989). Conceptual implications of two models of burnout: A reply to Golembiewski. *Group and Organization Studies*, 14, 15-22.
- Maslach, C., & Jackson, S. (1981). *The Maslach Burnout Inventory manual*. Palo-Alto, CA: Consulting Psychologists Press.
- Rose, R. M., Jenkins, C. D., & Hurst, M. W. (1978). *Air traffic controller health change study*. Washington, D. C.: FAA Office of Aviation Medicine.
- Russell, D. W., Altmaier, E., & Van Velzen, D. (1987). Job-related stress, social support, and burnout among classroom teachers. *Journal of Applied Psychology*, 72, 269-274.
- Schroeder, D. J., Thomas, S., Weltin, M., Vandeventer, A., Collins, W. E., Dollar, C.S., and Ritchie, L. (1986). *1986 FAA Employee Survey: National Report*. Washington, D. C.: FAA Office of Aviation Medicine.
- Smith, P. C., Kendall, L., & Hulin, C. (1969). *The measurement of satisfaction in work and retirement: A strategy for the study of attitudes*. Chicago: Rand-McNally.

*U.S.GPO:1992-661-063/40034