

# **Predictors of Work Performance Among Higher Education Employees: An Examination Using the ASSET Model of Stress**

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*This study used university-based statistics of performance and self-rated employee productivity to examine the relationship between stress levels, organizational commitment, health, and performance. The authors conducted a secondary analysis of data from staff in 13 higher education institutions. In common with earlier research, the authors found that stressors had a negative linear relationship with all the performance measures used. However, this relationship was also influenced by physical health, psychological well-being, and organizational commitment, and by the measure of performance used. In addition, the authors found variations in the relationship between performance and stress by category of staff, which suggests the influence of job factors. These findings are discussed in relation to previous research and their implications for English academic institutions.*

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Recent reports have drawn attention to high levels of occupational stress among university staff in comparison to other occupational groups in the United Kingdom (e.g., Kinman & Jones, 2003; Tytherleigh, Webb, Cooper, & Ricketts, 2005). Conversely, research examining the impact of stress levels on the productivity of staff and universities is sparse. Moreover, much of what has been reported identified relationships using only self-report measures of productivity and has concentrated principally on academic staff (e.g., Blix & Cruise, 1994; Kinman, 1996). Winefield et al.'s (2003) study of stress in Australian universities is one of the few to use a range of university-based objective measures of productivity. They found that work-related measures of stress were significantly and negatively linearly related to objective university-based performance measures such as funding cuts, staff-student ratios, and investment income. Different relationships between stress and performance were also found by category of employee, with academic staff reporting slightly higher levels of psychological distress and lower levels of job satisfaction compared with nonacademic staff.

## BACKGROUND

Research outside of a higher education context suggests that the connection between stress and performance is not clear. Although the majority of studies claim that high levels of stress have a direct negative linear relationship with performance, others see stress as necessary for improving performance. A third model, the inverted U, suggests that some stress is necessary, but that below and above an optimal level it has a detrimental impact on performance. However, Muse, Harris, and Field (2003) argue that the majority of studies have been biased toward supporting a negative linear explanation of the stress-performance relationship. In an early study, Jamal and Baba (1992) tested four different models of the stressor-performance relationship (including positive and negative curvilinear and linear relationships). A direct linear negative relationship between stress and performance was found overall, with those reporting higher levels of stress reporting lower levels of productivity. The authors also found small differences in the stress-performance relationship as a function of category of employee, which suggests that the stress-performance relationship may also be influenced by different functions at work.

Later research studies have shown that a variety of contextual and personal variables impact upon or mediate the stressor-job performance relationship. Jamal and Baba's (2001) study of Canadian college teachers found correlations between Global Type A behavior and job productivity, and between time pressure, competitiveness, and job performance. Cropanzano, Rupp, and Byrne

(2003) and Halpern (2005) reported a strong association between stress levels and both physical and mental health along with reduced performance. Workers who are ill are more likely to take sick leave and have a reduced capacity to perform successfully at work. However, the relationship between psychological well-being and performance is less clear.

A recent study by Donald and colleagues (2005) suggested a relationship between well-being and organizational commitment in determining self-rated productivity. They used ASSET—a shortened organizational stress evaluation tool—to examine the relationship between eight stressors, organizational commitment, physical and psychological health, and self-rated productivity in a large sample of employees in the United Kingdom ( $N = 16,001$ ) from 15 different organizations. In contrast to much of the earlier research, Donald et al. found that stress levels typically did not have a direct linear relationship with self-rated productivity; most of the variance in their data was predicted by psychological well-being, perceived commitment from the organization, and stress related to resources and communication at work. In addition, Donald et al. argued that their model is generalizable to other employee groups. Earlier research by Jamal (1985) also reported associations between stress and changes in organizational commitment, with organizational commitment having a strong moderating effect on the stress-performance relationship. These findings suggest a complex relationship between stress and productivity influenced by the way stress is conceptualized and measured, the way in which individual productivity and organizational performance are measured, category of employee, health and well-being of staff, and organizational commitment.

### THE CURRENT STUDY

A number of hypotheses were developed based on the existing empirical literature on stress and performance (Donald et al., 2005; Jamal & Baba, 1992; Winefield et al., 2003):

*Hypothesis 1:* There will be significant negative linear correlations between employee stress levels and measures of individual productivity and organizational performance.

*Hypothesis 2:* Donald et al.'s three-factor model of the relationship between stress and productivity will be found in both academic and research (A&R) and nonacademic staff.

*Hypothesis 3:* High levels of stress will be associated with poor self-rated employee productivity and university-based performance measures.

## METHOD

### Procedures

A total of 10,090 anonymous questionnaires (representing approximately 25% of the total sample population) were sent to a stratified random sample of staff working in 13 higher education institutions (HEIs). Where possible (and in accordance with the United Kingdom Data Protection Act), questionnaires were sent out to each employee's home address. This was to maintain confidentiality and anonymity. A stamped, addressed envelope was included with each survey pack to facilitate the return of completed questionnaires directly to the researchers.

### Sample Characteristics

The data used in this analysis were extracted from an original dataset obtained from a stratified random sample of 12 main categories of staff (nonacademic and academic), working in 13 English HEIs (see Tytherleigh et al., 2005, for further details). These comprised staff from eight old (pre-1992) universities, and five new (post-1992) universities. In order to simplify the model, only full-time employee responses from the 13 HEIs were analyzed ( $N = 3,160$ ). Of these, approximately one-third were A&R staff ( $N = 1,026$ ), the rest comprising nonacademic and faculty support staff. As the original sample was stratified, we were able to weight the ASSET scores by the population size of staff for each of the 14 HEIs. We considered that this provided sufficient representation of the population.

### Measures

#### *ASSET Organizational Stress Screening Tool*

Levels of stress, commitment, and health-related outcomes of stress were measured by using the ASSET (Cartwright & Cooper, 2002). The ASSET comprises four main questionnaires. The *Perceptions of Your Job* questionnaire has 37 items, scored from 1 (*strongly disagree*) to 6 (*strongly agree*), relating to eight sources of stress: work relationships, work-life balance, control, job security, overload, pay and benefits, resources and communication, and job overall. The *Attitudes Toward Your Organization* questionnaire has nine items, arranged over two subscales—Perceived Commitment from your organization and Commitment to your Organization. These items are

scored from 1 (*strongly disagree*) to 6 (*strongly agree*). The *Your Health* questionnaire has 19 items arranged over two subscales—Physical Health and Psychological Well-being—and scored from 1 (*never experienced the ill-health symptom or change of behavior over the last three months*) to 4 (*often experienced the ill-health symptom or change of behavior over the last three months*). The *Supplementary Information* questionnaire has 24 customized items, in this case designed to obtain biographical and demographical information specific to HEIs, such as subject discipline, university, grade, and category of employee.

### *Job Performance*

Three measures of performance were used: a self-rated individual measure of productivity and two objective university-based measures of performance. As with the Donald et al. (2005) study, we used a self-report item from the ASSET scale as a measure of individual productivity: “Over the last 3 months, roughly how productive have you felt in your job?” This item was scored on a five-point Likert scale ranging from 1 = *100% productive* to 5 = *less than 70% productive* (i.e., a higher score reflects lower performance levels). The objective university-based measure of research activity, that is, Research Assessment Exercise (RAE) scores ranging from 1 to 6, was obtained from the public domain for each university, having been published by the Higher Education Statistics Agency (HESA) and the Higher Education Funding Council for England (HEFCE) for the year 2001–2002 (i.e., the same year as the stress data were obtained). However, because this measure was considered relevant to A&R staff performance only, analysis using it was performed for A&R staff only. The Guardian Teaching Score for the year 2001–2002 was produced for each university by the Guardian Newspaper in 2003. This score aims to give an overall rating to each university and is a composite score made up of evaluations of teaching assessment, amount of money spent per student, staff-student ratios, job prospects for students, entry qualification, and a value added score.

## **RESULTS**

### **Correlations With ASSET**

A series of Cronbach’s alphas were calculated for each of the questions on the 12 ASSET subscales to identify the reliability of the ASSET with our data. These ranged from 0.61 to 0.84, with all but two factors (i.e., Work-life

**Table 1.** Intercorrelations Between the 12 ASSET Measures and the Three Measures of Performance

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1. Work-life balance	0.28**													
2. Overload	0.45***	0.58**												
3. Job security	0.40***	0.16	0.28*											
4. Control	0.68***	0.34**	0.52**	0.42**										
5. Resources	0.66***	0.32**	0.52**	0.35*	0.70***									
6. Job overall	0.57**	0.42**	0.51**	0.37*	0.56**	0.51*								
7. Pay and benefits	0.35*	0.20*	0.21*	0.21*	0.30*	0.23*	0.22*							
8. Commitment to the organization	-0.54***	-0.25*	-0.35*	-0.28*	-0.61***	-0.54**	0.44**	-0.27*						
9. Commitment from the organization	-0.35*	0.46**	-0.16	-0.24*	-0.43**	-0.38**	0.29*	0.15**	0.71***					
10. Health physical	0.32*	0.28*	0.38**	0.74***	-0.43**	-0.38**	0.36**	0.21*	-0.25*	-0.16*				
11. Psychological well-being	0.42**	0.38**	0.47**	0.29*	0.31*	0.24*	0.41**	0.19*	0.37*	-0.19*	0.68***			
12. Self-rated productivity	0.32**	0.19	0.29**	0.18**	0.34*	0.33**	0.26*	0.09	-0.36**	-0.31**	0.26**	0.41**		
13. RAE score	-0.18**	-0.03	-0.15**	-0.20**	-0.19**	-0.11**	-0.15**	-0.12**	0.21**	0.20**	-0.25**	-0.18**	-0.04	
14. GTS	-0.05	-0.13*	-0.15*	-0.27*	-0.29**	0.12	-0.11*	-0.10*	0.35**	0.29**	-0.23**	-0.12*	-0.13*	0.94***

Note.  $N = 3,160$  for correlations between the 12 ASSET subscales and the self-rated measure or productivity.  $N = 1,026$  for correlations between the 12 ASSET subscales and Research Assessment Exercise (RAE) and Guardian Teaching Score (GTS).

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

balance and Control) returning coefficients in excess of 0.70. Table 1 presents the Spearman's  $\rho$  correlation coefficients between the 12 subscales of the ASSET and the self-rated performance measures for all staff ( $N = 3,160$ ) and Spearman's  $\rho$  correlations between the 12 ASSET subscales and the two university-based scores for academic staff only ( $N = 1,026$ ). Significant correlations between the 12 ASSET subscales and the three performance measures ranged from  $\rho = 0.21$  to 0.74. Notable were the high correlations between self-rated productivity and the ASSET subscales of control, job security, resources communication, commitment from the organization, and physical health, which suggest negative linear relationships between some stressors and self-productivity, but that organizational commitment and physical health may also be implicated in this relationship.

### Data Screening and Model Development

We examined scores on the 12 ASSET subscales for outliers and fit between their distributions and the assumptions of regression analysis by applying an iterative application of Mahalanobis distance with  $p < .001$ . This process removed 183 cases with significant Mahalanobis distance values. We examined a two-stage model of development by using a stepwise regression analysis. In stage 1, we examined full-time A&R staff only ( $N = 984$ ), repeating the analysis for all full-time nonacademic support staff in stage 2 ( $N = 1,993$ ). This process also allowed us to examine the relationship between stressors, organizational commitment, health outcomes, and self-rated performance, and the generalizability of the model across different employee populations (as predicted by Donald et al., 2005), and whether differences occurred between employee populations working in HEIs (as identified by Winefield et al., 2003, and Jamal & Baba, 1992.) The self-rated performance scale was regressed using a standard stepwise regression model on respondents' scores on the 12 ASSET subscales; these were added on the basis of a criterion of change in  $R^2 = 0.005$  or above. This conservative method of criterion change was adopted because of the large sample size in the analysis. In addition, stepwise regression was calculated for A&R staff only to examine the relationship between the 12 ASSET stressors and the objective university-based measures of performance.

Table 2 shows the results of two stepwise regression analyses for predicting self-rated productivity for A&R staff and for nonacademic support staff.

These indicate three common predictors of self-rated productivity across the two groups of staff, ( $p > .005$ ): psychological health, resources and communication, and organizational commitment. This supports Donald et

**Table 2.** Standard Stepwise Regression of ASSET Subscales on Self-Rated Productivity: Academic and Research (Model 1) and Nonacademic Staff (Model 2)

Variable	Unstandardized $\beta$		Standardized $\beta$		<i>SE</i>	
	A&R	NA	A&R	NA	A&R	NA
Constant	2.21	2.04			0.229	0.206
Psychological well-being	0.050	0.047	0.031*	0.282**	0.006	0.004
Resources and communication	0.040	0.040	0.014*	0.142**	0.010	0.006
Commitment to the organization	-0.056		-0.180*		0.011	
Commitment from organization		-0.138**		0.144*		0.009
Pay and benefits		-0.061		-0.085**		0.018
Work relationships		0.016		0.097*		0.005
<i>R</i>			0.52	0.53		
Adjusted <i>R</i> <sup>2</sup>			0.21**	0.28**		

Note. A&R = Academic and Research staff; NA = Nonacademic staff. Academic and Research staff ( $N = 984$ ). Nonacademic staff ( $N = 1993$ ).

\*\*  $p < .001$ . \* $p < .005$ .

al.'s (2005) three factors as generalizable to different groups of staff. Model 1, calculated for A&R staff only, suggests that these three subscales of the ASSET significantly predict over 21% of the variance in self-rated productivity,  $F(3, 861) = 65.94$ ,  $p < .001$ . The beta values show that higher self-rated productivity is associated with good psychological well-being and that low levels of stress are associated with resources and communication within the organization. Higher organizational commitment by the employee to the organization is also associated with better self-evaluated productivity. Model 2 calculated for nonacademic support staff, suggests that five of the ASSET subscales significantly predict around 28% of the variance in employee self-rated productivity,  $F(6, 2017) = 90.25$ ,  $p < .0001$ . In comparison to Model 1, the beta weights for Model 2 indicate two further significant predictors: high levels of concern about pay and benefits and work relationships. In addition, high levels of perceived commitment from the organization to the employee significantly predicted self-rated productivity. These findings suggest a direct negative linear relationship between some stressors and self-rated productivity, but also the importance of organizational commitment and psychological well-being in the stress-performance relationship.

To examine the relationship between the 12 ASSET subscales and organizational productivity, we calculated stepwise regression for predicting performance as measured by RAE (Model 3) and Guardian Teaching Scores (GTS; Model 4), the results of which are shown in Table 3.

Model 3 suggests that three factors significantly predicted about 39% of the variance in RAE performance,  $F(3, 170) = 24.51$ ,  $p < .001$ . The beta values show that high research performance is associated with good physical health, which on its own accounts for most of the model variance. Perceived commitment from the organization to the employee and low levels of stress relating to work-life balance are also associated with a better RAE rating.

**TABLE 3.** Models 3 and 4: Standard Stepwise Regression of ASSET Subscales on Research Assessment Exercise (RAE) and Guardian Teaching Score (GTS)

Variable	Unstandardized $\beta$		Standardized $\beta$		SE	
	RAE	GTS	RAE	GTS	RAE	GTS
Constant	2.98	2.77			0.294	0.274
Control		1.76		-0.38**		0.302
Job security		0.09		0.12*		0.074
Physical health	-1.36	0.41	0.37*	-0.12*	0.311	0.214
Perceived commitment from organization	-1.02	-0.78	-0.14*	-0.11*	0.100	0.094
Perceived commitment to organization		0.56		0.09*		0.812
Work-life balance	0.033		0.12*		0.073	
R			0.57	0.62		
Adjusted R <sup>2</sup>			0.39**	0.42**		

Note. N = 984. Scores (Model 3) and GTS (Model 4).

\*  $p < .005$ . \*\*  $p < .001$ .

Model 4 shows the result of a stepwise regression for predicting performance as measured by the Guardian Teaching Score. This model suggests that five factors significantly predicted about 42% of the variance in RAE performance,  $F(4, 1026) = 45.27, p < .001$ . The beta values indicated that higher teaching performance by a university is associated predominantly with two sources of stress: control and job security among academic staff. To a lesser extent, high levels of perceived commitment from and to the organization and good physical health are also associated. These results suggest that, although health and organizational commitment among employees retain their importance in predicting university based of performance, the effects of other stressors are also important.

## DISCUSSION

Overall, our results raise a number of important issues for understanding the stress-performance relationship. Some but not all stressors in the ASSET model were associated with employee productivity and organizational performance; however, the relationship between stress levels and performance changed as a function of type of stress, the performance measure used, and category of staff. This suggests that some aspects of work stress, such as access to resources and good communication, good work relationships, and satisfaction with pay and benefits, may play a more pivotal role in the stress-performance relationship when performance is measured by self-evaluation. Where significant relationships exist they support the notion of a negative linear relationship between stress levels and productivity. However,

as Muse et al. (2003) emphasize, many measures, including the ASSET, conceptualize stress as a purely negative process, which influences the ability to test nonlinear relationships between stress and productivity.

The two regression models that examined the relationships between the 12 ASSET subscales and self-rated productivity highlight the importance of psychological well-being. This is in keeping with the research on burnout and supports the notion that stressors per se may not be the primary constraint to good productivity, but may instead limit employee's ability to cope with stress. Our findings provide partial support for a three-factor model of psychological well-being, organizational commitment, resources, and communication, for predicting self-rated productivity as proposed by Donald et al. (2005), and limited support for the model's generalizability across classes of employees. The importance of organizational resources for higher education staff performance is also supported by Kinman (1996), where lecturers linked their reduced work performance in quality and quantity to a reduction in resources. However, like Winefield et al. (2003) and Jamal and Baba (1992), we also found different significant associations for our two groups of employees in that high levels of stress linked with pay and benefits, and work relationships were significantly related to poorer self-evaluated productivity for nonacademic support staff only. However, both Donald et al. and our study are limited by the use of a one item self-evaluation of individual productivity.

The relationship between the ASSET subscales and two organizational performance measures revealed important new findings for universities and suggests that the stress-performance relationship is also influenced by the measure of productivity used. Low levels of stress for control, job security, good physical health, and commitment to and from the organization were significantly associated with good Guardian Teaching Score. However, in contrast, good organizational performance as measured by RAE scores appears to be related to employee physical health, perceived commitment from the organization, and the resources provided by the individual in terms of work-life balance. This has important implications for universities. Many studies have reported the excessively long working hours of HEI employees, with A&R staff often working in excess of 50 to 55 hours per week (Tytherleigh et al., 2005). This relationship may also have important implications for female academic staff, because work-life balance issues often have a differential impact on women (Hurst & Richards, 2002) due to the "caring family roles" for which they typically take responsibility. Good RAE and Guardian Teaching Scores could be reflecting "extrarole" activity, as defined by Bakker, Demerouti, and Verbeke (2004), versus self-rated productivity, a global measure of in-role productivity.

## CONCLUSION

Our findings suggest that a negative linear relationship exists between some sources of stress and both self-evaluated employee productivity and organizational measures or performance. However, we also found that physical health, psychological well-being, and organizational commitment play a significant role in understanding the relationship between stress levels and performance. Our findings broadly support Donald et al.'s (2005) claim for a three-factor model of good health, organizational commitment, high levels organizational resources, and communication associated with self-rated work performance. We also provide limited support for the generalizability of the three-factor model. Increasing pressure is being placed on HEIs to achieve higher ratings in the teaching and research areas, both to increase levels of funding and to improve their scholarly reputations; however, with limited resources at their disposal, they need to know where to direct interventions in order to improve the lives of staff and to increase performance. We, therefore, conclude that the job stress-job performance relationship in university staff warrants additional investigation, and that HEIs need to recognize that there are both organizational and individual reasons for preventing and/or tackling work-related stress.

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