

MODERATED PROPORTION TO ALLEVIATE PERCEIVED STRESS IN SOFTWARE CONTEXT - AN EMPIRICAL STUDY

R. DHANEESH¹, V. T. R. VIJAYA KUMAR² & R. V. SIVA BALAN³

¹Assistant Professor, Department of Business Administration, Narayanaguru College of Engineering,
Nagercoil, Tamil Nadu, India

²Associate Professor, Department of Business Administration, St. Xavier's Catholic College of Engineering,
Nagercoil, Tamil Nadu, India

³Associate Professor, Department of Computer Applications, Noorul Islam University, Thuckalay, Tamil Nadu, India

ABSTRACT

Employee's stress has increasingly become an anxiety for many organizations. Although it has been created a steady turn over in all sectors, it is quite huge in IT industry. Several researchers have pointed out a variety of factors that may scale back the negative impacts of occupational stress. The proposed framework is based on Job Demand Resource model (JDR model) to reduce negative impacts on occupational stress of software professionals which act as a primary level intervention. Providing necessary resources and fixing demands depending upon the skill discretion of an individual can help to avoid some kind of depression initially and mitigate negative impacts within the task. The result states that work resource and skill variety are inversely proportional to occupational stress, where as work demand is directly proportional to occupational stress. The consolidated degree of relationship between considered variables with the scope of reducing occupational stress is said to be the moderator called "Moderators for Satisfaction".

KEYWORDS: Occupational Stress, Moderator for Satisfaction, Degree of Relationship, Negative Impact and Job Satisfaction

INTRODUCTION

Stress is drawn in terms of its physical and physiological effects and may be a mental and emotional strain on an individual. Occupational stress is often created due to the harmful physical and emotional responses that occur since the provisions of the work do not match the capabilities, resources, or needs of the employees (NIOSH, 1999). Stress can be formed due to isolation in workplace, work for long hours, cyan genetic work environments, lack of autonomy, robust relationships between coworkers and management, harassment by management and lack of opportunities or motivation to enhance one's talent level.

Thus it creates job discontentment which brings a gradual decline in output significantly. During this state of affairs, a moderator is necessary to scale back the stress level of stressors, thereby bringing job satisfaction. Several Stress research studies have shown a variety of tempering factors that may scale back or reduce the negative effects of occupational stress. The foremost and systematically used moderators are 1) capability of an individual to tackle a scenario (Lazarus., R., & Folkman, S., 1984), 2) the emotional temperament of a person (Costa, P., & McCrae, R., 1992), 3) the dominant intensity of a person (Bakker, A. B. et al, 2007) and 4) social support from the environment. (House, J., 1981).

Johnson, J. V., & Hall, E. M., 1988 study point out that worker's job are classified as high demand, low management and low social support/isolation, which in turn increase the stress level of an individual. Additionally, in an organization, moderators are necessary to manage role overload, role conflict and role ambiguity at high management level than others (Gilboa, S., et. al 2008). Despite the fact, it is evidenced by (Bakker, A.B. & Demerouti, E., 2007), explaining the job demand resource model regarding work scenario, because it is the most significant character that comprise factors like job autonomy, channel of providing information and performance feedback.

On the other side, lack of call latitude and psychological demand produces stress for an individual leading to severe unhealthiness and changes in behavioral activities (Schnal, P.C., et.al 1994). Each individual perception might vary within the operating surroundings especially in their demand for resources to complete the task. Therefore, resources can be provided to some extent to reduce stress level that ensures a stronger output for the organization. Most of the organizations provide stress intervention program for the workers at the secondary level (Richardson, K.M., & Rothstein, H. R., 2008) it is better to concentrate on primary level intervention too. This can be implemented by giving necessary resources and setting up demands depending upon the skill discretion of an individual while allotting the task. This process helps to avoid some kind of depression initially and mitigate negative impacts within the task. This sort of trade off brings victimization to the organization.

LITERATURE REVIEW

Work resources, work demand and skill discretion have major impacts on stress that results in job discontent. Job resources like social support, performance feedback and autonomy might instigate a psychological surge resulting in job-related learning, work engagement and structure commitment. Job resources can be enhanced massively at the organizational level (e.g. pay, career opportunities, job security), at social level (e.g. supervisor and fellow worker support, team climate), at the level of labor involvement (e.g. role clarity, participation in call making) and at the task level (e.g. skill selection, task identity, task significance, autonomy, performance feedback), whereas job demands like a high work pressure, emotional demands and role ambiguity might lead to sleep problems, exhaustion and impaired health (Bakker, A. B., & Demerouti, E., 2007). The resultant work atmosphere is set by economic imperatives and cost/benefit market-based approaches than by human implications of those changes (Karasek, R.A, et.al, 1998).

The Demand-Control Model (DCM), pays attention to the human being by considering the work atmosphere and conceptualizes the work atmosphere as strictly for human construction and capable of amendment to associate optimum active learning atmosphere (karasek, R. A., 1979, Karasek, R.A., 1998 & Karasek, R.A., & Theorell, T., 1990). Several firms have needed IS (Information System) contractors to sign legal documents to guard confidential structure info associated to mandate the transfer of essential information to permanent workers once an assignment is completed. Work autonomy was measured with the Factual Autonomy Scale (Fox, S. P., et.al 1997) that was developed with the target of providing things that square measure factual in nature and prove against flectional bias. Job satisfaction that was on top of the center of the duty satisfaction scale did not appear to be related to meeting schedule or value goals of the organization (Kurt Linberg, R., 1999). Information sharing in a very cooperative environment has been found to completely have an effect on innovation performance (Nonaka, I., 1991 & Leonard-Barton, D., 1992), as it facilitates downside resolution and reduces the unskillfulness of re-inventing already existing solutions.

Work engagement is associate effective-motivational, work-related state of fulfillment in workers that's

characterized by vigor, dedication and absorption (Schaufeli, W. B., & Bakker, A. B. 2004). Significantly, recent studies have indicated that engagement connected completely to client satisfaction (Gilboa, S. et.al, 2008), in-role performance (Schaufeli, W. B., et.al, 2006b) and monetary returns (Xanthopoulou, D., et.al, 2009). Empirical studies have shown that job resources square measure vital correlates of engagement see for a meta-analysis, (Halbesleben, J.R., 2009), notably beneath conditions of high job demands (Bakker, A. B., et.al, 2007). Additionally, recent studies have in contestable that many personal resources like self-efficacy and organization-based vanity square measure associated with work engagement (Mauno, S. et.al, 2007 & Xanthopoulou, D., et.al, 2007). Previous cross-sectional studies (Hakanen, J., et. al, 2006; Saks, A.M. 2006; & Xanthopoulou, D., et.al, 2007) have shown that many job resources like autonomy, social support, super ordinate employment, performance feedback and opportunities for skilled development connected completely to figure engagement. (Myung-Yong, U. M., et.al, 1998) study reveals that the components which are related to role conflict create burn out in work stress leads to job dissatisfaction for an individual, whereas social support in work environment act as moderating and intervening factors for the same. Thus moderators are considered as essential tool to reduce the stress level of stressors.

CONCEPTUALIZATION

The framework focuses on moderator to reduce negative impact on stress in the work place. The study mainly concentrates on work resources, work demand and skill variety of an individual to complete the task in his/her work environment. Stress is often reduced by implementing a moderator, called “Moderator for Satisfaction” (Vijaya Kumar, V. T.R, et.al, 2013). Many models reveal that an individual perception can differ with change in work resources, demand and other environmental factors. The model ‘MFS’ (Moderators For Satisfaction) states work resource and skill variety are inversely proportional to occupational stress, where as the work demand is directly proportional to occupational stress. It also helps to predict the degree of relationship between work resources, work demand and skill variety in work place stress. In addition, the relationships of these aspects have been proved in survey. It is notable that, availability of excess resources can negatively affect economic growth of the organization which increases the stress level. Similarly an individual with good knowledge in a specific task have more demands placed on him which will also induce stress. On the other hand, low demand in work creates fear about job autonomy and the job insecurity also is a distress for an individual. Thus work resources, work demand and skill discretion is kept at a certain proportion to reduce the stress level of stressors. A sample model is shown in figure 1. The stressful job is given as input and the manipulated result or output thus obtained depends on moderators such as individual factors like perception, skill desertion, information, autonomy and situational factors like work resources, work demand, working environment which also act as stress management intervention. Thus, for every stressful work, it is necessary to provide certain input which act as moderators and give the maximum output for the same input.

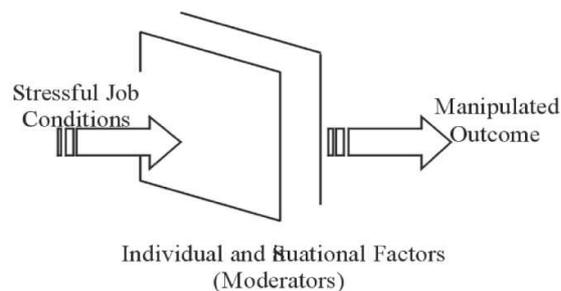


Figure 1: Individual and Situational Factor as Moderators

METHODOLOGY

It is an empirical study based on survey method. The study concentrates on work place stress of software employees working in Techno Park, Trivandrum. A pilot study was conducted on a small group of people from the population under study by face to face interaction. This may involve testing feasibility in practice or improving the methodological quality of parts of the study. With the help of pilot study, a structured questionnaire was prepared with a five point likert scale (indicate strongly agree, agree, neutral, disagree and strongly disagree) which consist of questions related to factors causing work place stress to the employees. The questionnaire was distributed employees working in techno park and the data was collected from 360 respondents based on simple random sampling technique by giving due representation to all categories of variables under study. Analysis was done with the help of statistical tools such as Karl Pearson correlation coefficient and Linear regression using statistical package for the social science and it is discussed in the next section.

RESULTS AND DISCUSSIONS

Correlation Analysis

Correlation analysis is used to measure the degree of relationship between two variables which are linearly related to each other. The result of correlation analysis shows the degree of relationship between work resources, work demand and skill variety in work place stress.

Table 1: Correlation between Occupational Stress and Work Resources

Correlations			
		Occupational Stress	Work Resource
Occupational Stress	Pearson Correlation	1	-.429**
	Sig. (2-tailed)		0.000
	N	360	360
Work resource	Pearson Correlation	-.429**	1
	Sig. (2-tailed)	0.000	
	N	360	360

** . Correlation is significant at the 0.01 level (2-tailed)

Table 1 indicates cause and effect relationship (correlation) between work resources and occupational stress for sample size N=360. Reporting, Environment, Information, Autonomy and System are considered as variables for work resources. The correlation coefficient value (r) for work resources and occupational stress is- 0.429 (negative correlation). It indicates that the work resources and workplace stress are inversely proportional to each other. Therefore occupational stress increases with decrease in work resources and it is statistically significant, indicated by p value as 0.00 ($p < 0.05$).

Table 2: Correlation between Occupational Stress and Work Demand

Correlations			
		Occupational Stress	Work Demand
Occupational Stress	Pearson Correlation	1	.700**
	Sig. (2-tailed)		0
	N	360	360
Work Demand	Pearson Correlation	.700**	1
	Sig. (2-tailed)	.000	
	N	360	360

Table 2 show degree of relationship (correlation) between work demand and occupational stress.

Work demand such as output efficiency, task variety, work engagement, adaptive capability and completion of target are taken in to account. The coefficient correlation (r) between the two variables is +0.700. This indicates that the work demand and occupational stress are positively correlated with each other. Therefore whenever the work demand is high, occupational stress also may be at the peak level and it is statistically significant indicated by p value as 0.000 ($p < 0.05$).

Table 3: Correlation between Occupational Stress and Skill Variety

Correlations			
		Occupational Stress	Skill Variety
Occupational Stress	Pearson Correlation	1	-.797**
	Sig. (2-tailed)		0.000
	N	360	360
Skill variety	Pearson Correlation	-.797**	1
	Sig. (2-tailed)	0.000	
	N	360	360

** . Correlation is significant at the 0.01 level (2-tailed)

Table 3 shows the relationship between occupational stress and skill variety. Technical skill, Communication skill, Conceptual skill, Managerial skill and Information Retrieval skill are the five different skills considered for the study. The correlation value (r) for occupational stress and skill variety is -0.797 which is negatively correlated with each other. It indicates that the occupational stress increases with decrease in skill variety and it is also statistically significant, which has been proved by p value less than 0.05 i.e. 0.000. From the analysis, a conclusion can be made that work resources and skill variety are negatively correlated with occupational stress whereas work demand is positively correlated with occupational stress.

Regression Analysis

Regression Analysis identifies the nature of relationship between dependent and independent variables, which explains the variations in one variable called dependent variable by a set of independent variables. The study mainly focuses on occupational stress level of software employees say dependent variable to that of independent variables such as work resource, work demand and skill variety. Table 4 displays R , R^2 , Adjusted R^2 and Standard error and the values are 0.939, 0.882, 0.881 and 0.242 respectively. R indicates the correlation coefficient between the variables. The value of R is 0.939, shows that the variable is positively correlated with occupational stress. R^2 value shows the strength of the variables (0.882) i.e., it explains that 88.2% of the occupational stress can be formed by work resource, work demand and skill variety. The remaining 11.8% are by other factors which are not taken in to account. Adjusted R^2 attempts to correct R^2 to more closely reflect the goodness of fit of the model in the population.

Table 4: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939 ^a	.882	.881	.242

^a**Predictors:** (Constant), Skill variety, Work resource, Work Demand

Table 5 summarizes the result of regression ANOVA. The sum of squares, degrees of freedom and mean square are displayed for two sources of variation namely residual and regression and are statistically significant which is proven by p -value as 0.000 (less than 0.05). The output for regression display information about the variation accounted in the model, whereas residual display information about variation that are not accounted in the model. The algebraic sum of

both gives total output. A variation found in dependent variable is explained clearly, since the value of regression sum of squares (155.611) is greater than residual sum of square i.e., 20.789. The p-value is 0.000, which is statistically well significant i.e. independent variable well explains the variation in occupational stress i.e., dependent variable.

Table 5: ANOVA Model Summary

ANOVA					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	155.611	3	51.87	888.263	.000 ^a
Residual	20.789	356	.058		
Total	176.4	359			

^a. **Predictors:** (Constant), Skill variety, Work resource, Work Demand

^b. **Dependent Variable:** Occupational Stress

Table 6 shows the regression coefficient. The unstandardized and standardized Coefficient is calculated through it. The standardized Coefficient or betas attempt to make the regression coefficient more comparable as often in the independent variable are measured in different units. The unstandardized coefficients show the results of the variables. The regression coefficient table indicates that work resource, work demand and skill variety are the variables which influence occupational stress. Work resource and skill variety are negatively correlated with occupational stress, whereas work demand is positively correlated with occupational stress. The values of work resource, work demand and skill variety are -0.507, +0.613 and -0.465 are statistically significant, since the p- value is 0.000 which is less than 0.05. It implies that the observed phenomenon applies to the population under study.

Table 6: Coefficients Table

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.324	.147		29.459	.000
	Work resource	-.507	.026	-.362	-19.699	.000
	Work Demand	.613	.03	.429	20.267	.000
	Skill variety	-.465	.019	-.535	-25.107	.000

^a. **Dependent Variable:** Occupational Stress

The upshot proportion is, Occupational stress can be formed by work resource, work demand and skill variety. From the analysis it is observed that,

Occupational stress = F (work resource, work demand and skill variety)

Occupational stress = F (4.324-0.507 work resource+0.613 work demand -0.465 skill variety)

The above formulation helps to predict the maximum proportionate change in the value of work resources, work demand and skill variety which creates eustress and also it helps to find the point at which it turns to distress.

CONCLUSIONS

Occupational stress results in inconsistency of an individual to meet the demand that can vary from person to person, depend on their perception and the way in which handling the situations. It affects psychological and behavioral nature of an individual which directly reflects in their outcome. Thereby it increases the perceived stress level of individual

employees. By providing necessary optimum resources for an individual for the task with equal level of demand could vary perceived job stress. Skill variety with work demand and availability of resources act as moderator for satisfaction (MFS) which reduce existing stress level of stressors. This sort of stress management intervention brings a trade off in work place stress. Moderator for satisfaction also helps to find the degree of relationship between the work demand, work resources and skill variety with work place stress. Hereby it is concluded that by tweaking stress inflicting factors (work resources, work demand and skill variety) in a certain proportion will cut back stress level of individual employees, thus it brings job satisfaction.

REFERENCES

1. Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, **22** (3), 309-328.
2. Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement particularly when job demands are high. *Journal of Educational Psychology*, **99**, 274-284.
3. Costa, P., & McCrae, R. (1992). *NEO PI-R (Professional Manual)*. Odessa: Florida: Psychological Assessment Resources.
4. Fox, S. P., Spector, E., & Van Katwyk, P. (1997). Objectivity in the assessment of control at work. *Paper presented at the annual meeting of the Society for Industrial and Organizational Psychology*. St. Louis.: Society for Industrial and Organizational Psychology.
5. Gilboa, S., Shirom, A., Fried, Y., & Cooper, C. (2008). A meta-analysis of work demand stressors and job performance: examining main and moderating effects. *personnel psychology*, **61** (12), 227-271.
6. Hakanen, J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology*, **43**, 495-513.
7. Halbesleben, J. R. (2009). A meta-analysis of work engagement: Relationships with burnout, demands, resources and consequences Psychology. In A. B. Bakker, & M. P. Leiter. New York: Psychology Press.
8. House, J. (1981). *Work and Stress and Social Support*. Addison: -Wesley.
9. Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support and cardiovascular disease: A cross sectional study of a random sample of the Swedish working population. *American Journal of Public Health*, **78**, 1336-1342.
10. Karasek, R. A. (1998). Demand/Control Model: A social, emotional and physiological approach to stress risk and active behaviour development. *Encyclopaedia of occupational health and safety*, **34** (14), 6-34.
11. Karasek, R. A. (1979). Job demands, job decision latitude and mental strain: Implications for job redesign. *Administrative Science Quarterly*, **24**, 285-307.
12. Karasek, R.A, Siegrist, J., & Theorell, T. (1998). Joint statement on the relationship between the two theoretical models measuring stress at work: the demand-control model (DC) and the effort-reward imbalance model (ERI). [On-line]. Available:.

13. Kurt Linberg, R. (1999). Software developer perceptions about software project failure: a case study, Walden University, 6328 Eden Prairie Road, Eden Prairie, MN 55346, USA, Received 7 November 1998; received in revised form 29 November 1998; accepted. *The Journal of Systems and Software*, **49**, 177-192.
14. Karasek, R.A., & Theorell, T. (1990). *Healthy work: stress, productivity, and the reconstruction of working life*. New York: basic books.
15. Lazarus., R., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.
16. Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, **13**, 111-126.
17. Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, **70**: 149-171.
18. Myung-Yong, U. M., Dianne, & Harrison, F. (1998). Role stressors, burnout, mediators and job satisfaction: A stress-strain-outcome model and an empirical test. *Social Work Research swr.oxfordjournals.org*, **22** (2), 100-115.
19. NIOSH. (1999, December 13). Stress at work. *National Institute of Occupational Health and Safety*. <http://www.cdc.gov/niosh/stresswk.html>.
20. NONAKA, I. (1991). The knowledge-creating company. *Harvard Business Review*, 96-104.
21. Richardson, k. M., & Rothstein, H. R. (2008). Effects of Occupational Stress Management Intervention Programs: A Meta-Analysis. *ournal of Occupational Health Psychology*, **13** (1), 69-93.
22. Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*, **21**, 600-619.
23. Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, **25**, 293-315.
24. Schaufeli, W. B., Taris, T. W., & Bakker, A. B. (2006b). On the differences between work engagement and workaholism. In D. Jeckyll, M. Hyde, & I. R. (Ed.) (Ed.), *Research companion to working time and work addiction*. (pp. 193-217). UK: Northampton Edward Elgar.
25. Schnall, P. C., Landsbergis, P. A., & Baker, D. (1994). Job strain and cardiovascular disease. *Annu Rev Public Health*, **15**, 381-411.
26. Vijaya Kumar, V. T.R, Dhaneesh, R., & Siva Balan, R. V. (2013). Rationale management approach in stress management: an information perception. *American Journal of Applied Sciences*, **10** (1), 89-96.
27. Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, **14**, 121-141.
28. Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2009). Work engagement and financial returns: A diary study on the role of job and personal resources. *Journal of Occupational and Organizational Psychology*, **82**, 183-200.