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ABSTRACT

This study examined the interrelationships between stress, job satisfaction, and other exogenous influences among academic deans at American colleges and universities. A total of 579 deans from a sample of 360 colleges and universities responded to a mailed survey, which included the Role Conflict and Role Ambiguity Questionnaire (Rizzo et al., 1970). The study found that as work-related stress increased, job satisfaction declined. Conversely, when job satisfaction increased, work-related stress declined. The jointly derived models account for 50 percent of the variance in job satisfaction and 30 percent of the variance in work-related stress. The study also found that female deans experienced more job satisfaction than male deans, and that older deans experienced less stress than younger deans. A dean's satisfaction with his or her current level of scholarship reduced stress, while higher perceived faculty quality increased stress. Finally, increases in role conflict and role ambiguity directly added to job stress. Minority status, marital status, having children living at home, and the size of the institution had little affect on either job satisfaction or work-related stress. (Contains 56 references.) (MDM)

The Interconnections Between Job Satisfaction and Work-Related Stress in Academic Deans

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Optimal levels of stress can energize us, leading to greater productivity, enjoyment in what we do, and creativity (Cox & Harquail, 1991; Gattiker & Larwood, 1990; Tharenou, Latimer & Conway, 1984). However, as stress exceeds optimal levels job satisfaction declines and it compromises work outcomes, such as job performance, morale, and commitment to the organization (Bedeian & Armenakis, 1981; Fried & Tiegs, 1995; Gupta & Beehr, 1979; Judge, Boudreau & Bretz, 1994; Kahn & Byosiere 1992; Sutherland & Cooper, 1988; Assoulini & Meir, 1987; Matteson & Ivancewich, 1987; Schwab, Jackson & Schuler, 1986; McGrath, 1976). Likewise, job dissatisfaction, coupled with other exogenous influences, increases work-related stress (Assouline and Meir, 1987; Austin & Gamson, 1983; Bedeian & Armenakis, 1981; Deaux, 1985; Fried & Tiegs, 1995; Ivancevich & Matteson, 1980; Jackson & Schuler, 1985; Judge et al, 1994; Kahn & Byosiere, 1992; Kemery, Bedeian, Mossholder & Touliatos, 1985; Lefkowitz, 1994; McBride, Munday & Tunnell, 1992; Sarros, Gmelch & Tanewski, 1997; Simpson, 1984; Van Mannen & Katz, 1976). Therefore, stress and job satisfaction simultaneously and continually impact upon each other.

While prior studies have recognized the interplay between stress and job satisfaction, the relational models used have, for the most part, failed to account for the endogenous determination of stress and job satisfaction outcomes. When such endogenously determined variables are derived separately or sequentially, Ordinary Least Squares coefficient estimates will be both biased and inconsistent (Davidson and MacKinnon, 1993, p. 214). This paper examines the interconnections between job satisfaction and work-related stress in academic deans while

controlling for simultaneity bias by jointly estimating stress and job satisfaction models.

The paper begins by exploring research into variables that contribute to job satisfaction and stress. Then, drawing from a national survey of academic deans, it introduces a method for dealing with inherent stress/job satisfaction simultaneity and models the interrelationships between stress, job satisfaction and other exogenous influences. The empirical results are examined in support of the paper's conclusions showing the strength of the stress/job satisfaction interrelationship and the ways in which gender, race, role conflict, role ambiguity and other external factors relate to the system.

Job Satisfaction, Work Related Stress and Compounding Variables

Research suggests that significant links exist between certain personal or institutional variables (e.g., age, gender, race, experience, recognition, and size of organization) and work-related stress and job satisfaction (Bartel, 1981; Clark & Oswald, 1996; Clark, 1995; Fried & Tiegs, 1995; Glisson & Durick, 1988; Idson, 1990; Judge *et al.,* 1994; Meyerson 1994; Pfeffer & Langston, 1993; Reyesss & Shin, 1995; Schaubroeck et al , 1989; Sarros *et al.*, 1997). Research evidence also reveals that on-the-job role ambiguity and role conflict are major ingredients in the determination of levels of work-related stress and job satisfaction (Abdel-Halim, 1981; Bedeian & Armenakis, 1981; Fisher & Gitelson, 1983; Fried & Tiegs, 1995; Sarros et al., 1997; Schaubroeck, Cotton & Jennings, 1989; Wolverton, Wolverton & Gmelch, forthcoming). One study has shown a direct relationship between role ambiguity and job satisfaction but found no relationship between role conflict and job satisfaction (Schaubroeck *et al.*, 1989). Another recent

study finds that seemingly insignificant direct relationships may be impacting the stress/job satisfaction system indirectly (Sarros, *et al.*, 1997). In their study of Australian department heads (i.e., chairs), they found that gender influenced job satisfaction directly, age directly affected work-related stress but had no direct effect on job satisfaction, and work experience indirectly impacted stress and job satisfaction through its moderating effect on role ambiguity.

One stream of research examines satisfaction with pay, a form of recognition, as a component of job satisfaction (Clark & Oswald, 1996; Heneman & Schwab, 1985; McBride, Munday & Tunnell, 1992; Summers & Hendrix, 1991). In most instances, equity variables, such as compensation schemes and work pace, were significant predictors of job satisfaction. If employees perceived that compensation was distributed fairly and that they were asked to complete work in a reasonable amount of time, job satisfaction increased (Bluedorn, 1982; Folger & Konovsky, 1989; Scholl, Cooper & McKenna, 1987; Ronen, 1986).

Academic organizations generate pressures and concerns that are peculiar to colleges and universities. In particular, academic administrators engage in a crucial balancing act between their leadership and administrative responsibilities and a desire to pursue their own scholarship. Stress results from attempting to strike this balance. Ongoing research into academic deans shows that deans select lack of satisfaction with their levels of personal scholarly activity and their inability to balance administrative and scholarly duties as two of the top ten stress variables affecting them. They also rate work load, frequent interruptions, and having to meet too many deadlines (which are work control issues) as top stressors. Furthermore, the way in which deans perceive their role confounds the situation. Deans who see their role as being primarily

administrative are impacted less by scholarship and work-control variables than deans who view themselves as faculty members first and administrators second. Funding for programs is also an important issue, as is faculty quality. The greater the need to secure funding for programs and the higher the quality of faculty the higher the stress, whereas role clarity impacts job satisfaction.[1] Finally, research suggests that deans who have children living at home experience more role conflict and ambiguity, both of which contribute to stress and job satisfaction (Gmelch, Wolverton & Wolverton,1997; Sarros *et al.*, 1997; Wolverton, *et al.*, forthcoming).

The Study

Academic deans across the United States were surveyed between October 1996 and January 1997 (Gmelch, Wolverton, Wolverton & Hermanson, 1996). The sample was constructed according to the following criteria. Potential sample institutions came from one of the following three groupings of Carnegie classifications—Research I & II and Doctoral I & II, Masters I & II, or Baccalaureate I & II. Sixty public and sixty private institutions were randomly selected from each Carnegie category resulting in a sample of 360 institutions. At each of the sample institutions, the deans of the colleges of education, business, liberal arts, and allied health professions were then asked to complete the survey. In a few instances, colleges of social work or a similar discipline were also included in the survey in a purposeful attempt to increase the number of female respondents. The overall sample size consisted of 1,370 deans, and the response rate was 60%. The sample used in this paper is a subgroup of 579 deans who responded

[1] These relationships were found to be true for department chairs, and the assumption is that they might also hold true for deans.

to all questions concerning variables analyzed herein. The major aspects of the Dillman (1978) *Total Design Method* were used in the design and distribution of the survey.

The survey include the Role Conflict and Role Ambiguity Questionnaire instrument (Rizzo et al., 1970), characteristic and response variables relevant to this study, and additional instruments and variables intended for analysis in a number of other studies. The Role Conflict and Ambiguity Questionnaire is a 14-item instrument used to determine the level of perceived role conflict and role ambiguity among deans. This instrument has been psychometrically verified across a broad range of studies (Schuler, Aldag and Brief, 1977; Tracy and Johnson, 1981). More recent studies have validated both the stability and the reliability of the constructs (Kelloway & Barling, 1990; King & King, 1990; Netermeyer, Johnson & Burton, 1990; Smith, Tisak & Schmieder, 1993).

General Profile of Respondents

The majority of the deans in this subset work at public universities; however, about 40% of the sample are employed at private institutions. Thirty-seven percent of the group are women; 10% are of minority status. The average college is made up of 138 faculty (we used the sum of department chairs, full-time faculty, and adjunct faculty as a proxy for size of organization). College size, however, ranges from a low of 6 members to a high of 1,013. As a whole, these deans rate the quality of their faculty above average ($\bar{x} = 3.97$ where 5 is high). All responding deans viewed both public and private funding for their institutions as somewhat weak. When asked to indicate their level of agreement on a 1 (low) to 5 (high) scale with the statements "this university has a strong private funding base" and "the state has a strong financial commitment to

the university" the average response in the first instance was $\bar{x} = 2.43$ and $\bar{x} = 2.11$ in the second. These deans are, on average, 53.8 years old (the youngest being 31 years and the oldest 76 years). Eighty-three percent of the sample are married and may have as many as six children living at home, the average, however, is 0.56. Their experience as deans (both in their current and previous positions) ranges from 0.25 to 46 years (average, 7.46 years). Most deans perceive themselves to be part administrator, part faculty (58%). However, a sizable proportion (34%) view themselves solely as administrators. In contrast, only 8% define their role strictly in terms of being faculty. On a 1 (low) to 5 (high) point scale, deans in the sample were moderately satisfied with the level of role clarity they experience ($\bar{x} = 3.89$), the pace of work ($\bar{x} = 3.33$), their control of their work environment ($\bar{x} = 3.31$), and their compensation packages ($\bar{x} = 3.45$). They were less satisfied, however, with their work load ($\bar{x} = 2.99$) and their level of personal scholarship ($\bar{x} = 2.21$). Overall job satisfaction averaged 3.93. Overall dean stress averaged 3.10 with a standard deviation of about one. (See Table 1.)

Methodology

The simultaneous equation system employed in the study is of the form

$$Stress = \alpha(Job\ Satisfaction) + \mathbf{X}^{S}\beta + \mu^{S} \quad (1)$$

$$Job\ Satisfaction = \gamma(Stress) + \mathbf{X}^{JS}\delta + \mu^{JS}, \quad (2)$$

where stress and job satisfaction are endogenously determined and $\mathbf{X}^{S}$ and $\mathbf{X}^{JS}$ represent vectors of exogenous and predetermined stress and job satisfaction variables, respectively. The resulting two-equation system was estimated using the SAS SYSLIN procedure, which determines the coefficients on the endogenous variables jointly (SAS Institute Inc., 1993) eliminating the

simultaneity bias inherent in sequential and single equation models, thereby providing unbiased and consistent estimates of endogenous and exogenous variable coefficients.

Exogenous variables included in the initial stress (1) and job satisfaction (2) equations were selected to retain fidelity to the extant literature and also to test which variables significantly and directly impact both stress and job satisfaction. The initial stress estimation model (equation 1) included respondent indications of overall job satisfaction as the endogenous variable and age, gender, marital status, number of children living at home, race (coded as minority or non-minority), years of experience as a dean, satisfaction with scholarly production since becoming dean, self perception as an academic or as an administrator, faculty quality rating, private and public financial support ratings, the role conflict score and the role ambiguity score as exogenous variables. The initial job satisfaction estimation model (equation 2) included respondent indications of job-related stress as the endogenous variable and age, gender, race, years of experience as a dean, satisfaction with scholarly production since becoming dean, satisfaction with the clarity of the respondents' role as dean, satisfaction with the pace of work, satisfaction with the work load, control of the work environment, indication of compensation adequacy, faculty quality rating, private and public financial support ratings, size of the faculty being administered, the role conflict score and the role ambiguity score as exogenous variables. Exogenous variable effects shown to be indirectly affecting either of the outcome variables through the endogenous relationship were dropped from the initial model in order to determine the final simultaneous equation model.

Role conflict and role ambiguity scores were derived through principal components factor analysis of the Role Conflict and Ambiguity Questionnaire instrument (Rizzo, *et al.*, 1970).

Consistent with the instrument, two factors were derived and a VARIMAX rotation was employed to generate standardized and uncorrelated factor scores for use in the stress/job satisfaction simultaneous equation models.

Results

One of the principal findings of this study confirms earlier research that suggests the existence of an endogenous relationship between work-related stress and job satisfaction. As shown in table 2, the endogenous relationship is strong, appropriately signed and highly significant (job satisfaction *t*-ratio = -7.74, *p*-value = .0001; work-related stress *t*-ratio = -5.18, *p*-value = .0001). As expected, when work-related stress increases job satisfaction declines. Conversely, when job satisfaction increases work-related stress declines. The jointly derived models account for 50% of the variance in job satisfaction and 30% of the variance in work-related stress. After controlling for simultaneity, the models that emerge give a clearer picture of how the exogenous variables impact of on work-related stress and job satisfaction.

The result showing that females experience more job satisfaction substantiates earlier work by Clark (1995) conducted in a business setting. The positive contributions of adequate compensation and properly paced work to job satisfaction also confirm earlier research. In addition, believing that you work with quality faculty and that the university receives adequate funding directly and significantly increase job satisfaction for deans. Finally, role clarity and control of the work environment add to job satisfaction, whereas increased role ambiguity lowers job satisfaction levels.

Age, role conflict, and satisfaction with current levels of personal scholarship appear to

have no direct impact on job satisfaction, but instead enter the jointly determined model indirectly through their effects on work-related stress. Consequently, these variables were dropped from the job satisfaction equation in the final model. Likewise, being a minority dean and adequacy of funding appear to influence job stress indirectly through their impact on job satisfaction, and were dropped from the final stress equation. As table 2 shows, the final model has a slightly better fit, and variable signs and significance levels are consistent with the initial model.

Six exogenous variables—age, being female, scholarship satisfaction, faculty quality, role conflict, and role ambiguity—directly influence work-related stress in deans. The older the dean, the less stress he or she experiences. Female deans exhibit significantly higher levels of stress than male deans. A dean's satisfaction with his or her current level of scholarship reduces stress. Faculty quality positively correlates with job stress; the higher the perceived faculty quality, the higher the stress levels in deans. Finally, increases in role conflict and role ambiguity scores directly add to job stress.

It appears that minority status, although not a highly significant variable in either model, may impact stress indirectly through lower levels of job satisfaction, where the relationship appears to be marginally significant. Unfortunately, the minority sample was too small and diverse to make a certain determination about the role minority status plays in either model. The results, however, indicate that further investigation is warranted.

Contrary to previous research findings from the business world, the size of the

organization seemed to be insignificant in affecting either job satisfaction or work-related stress.[2] Likewise, marital status and having children living at home seem to have no effect in either model. Recent research on deans, however, suggests that these variables do affect role conflict and ambiguity levels and thus may be entering one or both of the models indirectly through these variables (Wolverton, Wolverton & Gmelch, 1997). In addition, neither experience as a dean nor a dean's perception of his or her role as being an administrator or an academic (compared to the perception of a joint academic and administrative role) directly affected stress or job satisfaction. Other evidence, however, suggests that experience may be entering the models indirectly through the role ambiguity variable (Sarros *et al.*, 1997).

Implications

The overarching importance of this study lies in its methodology. Simply put, when we examine the level of work-related stress or job satisfaction in deans, we can not afford to look at one to the exclusion of the other. In fact, the conclusions drawn in earlier studies, which took one of these variables into account to the exclusion of the other, may indeed be biased. For instance, previous studies have shown negative effects of department size on chair job satisfaction and a positive correlation between department size and chair stress (Gmelch & Burns, 1994). When we control for simultaneity bias, size of the college appears not to matter.

In addition, two findings reveal important implications for practice, and two others raise important questions that beg further inquiry. In the case of practice, work load may not matter as

[2] It is important to note, however, that the survey results modeled here capture the number of faculty supervised. Future researchers may want to measure the size of the university to better test an academic corollary for the bureaucracy associated with large business organizations.

long as deans have sufficient control over their work environments and are given adequate time to accomplish the work. In other words, deans have no problem working hard as long as they have the autonomy to do the job their way and the flexibility to do it on their own time line. Likewise, high quality faculty coupled with insufficient or marginal funding may increase dean stress because of the difficulties they experience trying to adequately support faculty in their work and in trying to retain them at their institutions. In addition, deans may simply feel greater pressure to perform when their faculty are of the highest caliber. The higher the quality the faculty, however, the more satisfying the dean's job becomes. A word of caution must be added here. While the stress created by working with or for exemplary faculty may in some ways be ameliorated by the job satisfaction deans experience under these conditions, funding problems, and consequently lower job satisfaction, certainly cloud the picture and should not be casually dismissed.

In the case of further research, female deans not only experience higher levels of work-related stress but appear to be happier in their jobs. We must ask the question: Why? In a similar manner, we must explore the disturbing finding that although minority status deans seem to experience similar levels of stress as white deans they appear to be less satisfied in their positions.

We base our conclusions on one study of deans. The findings, however, speak for themselves. By using a simultaneous equation system to control for the relationship between mutually interdependent endogenous variables, we eliminate the bias inherent in single equation models. In doing so, we produce a clearer picture of the impact of exogenous variables on job satisfaction and stress. This analytical approach deserves serious consideration as researchers in

other situations investigate relational systems that are distorted by interdependencies between simultaneously determined variables.

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Table 1: Descriptive Statistics

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Personal					
Gender = Female	579	.37	.48	0	1
Married	579	.83	.38	0	1
Age	579	53.8	6.2	31	76
No. of Children at Home	579	0.56	0.94	0	6
Minority Status	579	.10	.30	0	1
Years as Dean (Experience)	579	7.46	6.14	.25	46
Satisfaction with Scholarship	579	2.21	1.08	1	5
with Role Clarity	579	3.89	1.01	1	5
with Work Pace	579	3.33	1.13	1	5
with Work Load	579	2.99	1.24	1	5
with Work Control	579	3.31	1.12	1	5
with Compensation	579	3.45	1.12	1	5
Overall Job Satisfaction	579	3.93	.77	1	5
Overall Dean Stress	579	3.10	.97	1	5
Viewed Self as . . .					
an Faculty	579	.08	.27	0	1
an Administrator	579	.34	.47	0	1
Both	579	.58	.49	0	1
Faculty Quality	579	3.97	.67	2	5
Public Institution	579	.61	.49	0	1
Private Institution	579	.39	.49	0	1
Private Funding	579	2.43	1.21	1	5
Public Funding	579	2.11	1.14	1	5
Number of Faculty	579	138	1.41	6.0	1013.0

Table 2: Simultaneous Equation Models of Stress and Job Satisfaction

Variable	Initial Model		Final Model	
	Stress (t-ratio)[1]	Job Satisfaction (t-ratio)[1]	Stress (t-ratio)[1]	Job Satisfaction (t-ratio)[1]
Intercept	5.148 ***(11.95)	1.815 ***(5.78)	5.135 ***(11.94)	1.971 ***(9.18)
Job Satisfaction	-0.389 ***(7.45)		-0.393 ***(7.74)	
Stress		-0.130 ***(4.44)		-0.142 ***(5.18)
Age	-0.017 ***(2.69)	0.002 (0.49)	-0.017 ***(2.70)	
Female	0.227 ***(3.06)	0.085 *(1.77)	0.234 ***(3.17)	0.089 *(1.86)
Married	0.061 (0.64)		0.060 (0.63)	
Number of Children	0.022 (0.57)		0.025 (0.63)	
Racial Minority	0.024 (0.21)	-0.119 (1.53)		-0.109 (1.41)
Experience (years)	-0.002 (0.28)	-0.001 (0.36)	-0.002 (0.31)	-0.001 (0.21)
Scholarship Satisfaction	-0.056 *(1.68)	0.027 (1.20)	-0.056 *(1.71)	
Perceived Academic	-0.114 (0.88)		-0.115 (0.89)	
Perceived Administrator	-0.039 (0.52)		-0.047 (0.64)	
Faculty Quality	0.101 *(1.85)	0.098 ***(2.65)	0.104 *(1.92)	0.103 ***(2.83)
Private Funding Adequacy	0.018 (0.60)	0.048 **(2.43)		0.049 **(2.47)

Public Funding Adequacy	-0.031	0.051		0.052
	(1.00)	**(2.45)		**(2.50)
Role Conflict Score	0.282	-0.022	0.281	
	***(7.65)	(0.81)	***(7.65)	
Role Ambiguity Score	0.122	-0.056	0.121	-0.056
	***(3.20)	**(2.04)	***(3.22)	**(2.12)
Size of Faculty		-0.00002		-0.00005
		(0.10)		(0.30)
Satisfaction With . . .				
Role Clarity		0.150		0.148
		***(5.15)		***(5.11)
Work Pace		0.090		0.088
		***(2.70)		***(2.64)
Work Load		0.024		0.028
		(0.77)		(0.90)
Control of Work Environment		0.164		0.168
		***(6.42)		***(6.72)
Compensation		0.068		0.070
		***(3.05)		***(3.18)
Adjusted R^2	.301	.497	.303	.498
F-statistic	***17.58	***34.68	***21.93	***41.96
Number of Observations	579	579	579	579

[1] Reported as absolute values.
*** Significant at the .01 level.
** Significant at the .05 level.
* Significant at the .10 level.

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