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# *Sources and Outcomes of Stress in Organizational Settings: Toward the Development of a Structural Model<sup>1</sup>*

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*An integrated structural model of stress in organizations was developed and tested through path analysis. Results provided qualified support for the causal assumptions underlying the model. Role frustration and short lead times were found to be potent stressors. Felt stress and low organizational commitment independently contributed to voluntary turnover.*

Recent reviews of the stress literature (Beehr & Newman, 1978; Beehr & Schuler, 1982; Van Sell, Brief, & Schuler, 1981) indicate that few studies have examined the multivariate linkages among the causes and consequences of stress in organizational settings (for exceptions, see House and Rizzo, 1972; Miles and Perreault, 1976). Furthermore, only limited attention has been devoted (Bedeian & Armenakis, 1981; Miles, 1964) to assessing empirically the causal relationships among sets of organizational, task, role, and individual variables posited in theoretical models of stress (Beehr & Newman, 1978; Caplan, Cobb, French, Harrison, & Pinneau, 1975; Cooper & Marshall, 1976; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; McGrath, 1976). The purpose of the present study, therefore, is to develop a preliminary structural model of stress, its antecedents and outcomes, and test the linkages specified in the model through path analysis.

In formulating the proposed structural model, the study went beyond the theoretical perspectives provided in the Kahn et al. (1964) model and incorporated important elements from recent conceptualizations of stress (Beehr & Newman, 1978; Beehr & Schuler, 1982; Caplan et al., 1975;

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McGrath, 1976; Van Sell et al., 1981). Building on McGrath's (1976) proposition that stress in organizations originates from the behavior setting, tasks, and roles, as well as characteristics of the "person system," the model includes contextual, role-related, and personal variables as antecedent conditions potentially influencing job stressors.

## Variables

### Contextual

Recent studies (Adams, Laker, & Hulin, 1977; Parasuraman & Alutto, 1981) have provided empirical support for the proposition that the behavior setting or sector of organizational space in which individuals are located provides a contextual basis for differential interpretations of or "meaning" ascribed to system events (Katz & Kahn, 1966; McGrath, 1976). Hence the concept of subsystem, reflecting the horizontal differentiation of organizational space, was included as a primary contextual variable capable of influencing perceptions of stressors and stress reactions. Insofar as assignment to different work schedules forces separation of workers, it represents another source of differential work experiences and perceptions (Parasuraman & Alutto, 1981). Thus work shift, which captures the temporal dimension of separation in terms of organizational space, represented another salient contextual variable of interest.

### Role-Related

Katz and Kahn (1966) and McGrath (1976) posited that various aspects of organizational roles could influence individuals' work experiences and reactions. Among the variables found to be related to individuals' stress perceptions and their responses are: organizational level (Kahn et al., 1964; Parasuraman & Alutto, 1981; Van Sell et al., 1981); supportive leadership practices (Caplan et al., 1975; House & Rizzo, 1972); and task characteristics (Brief & Aldag, 1976; Hall & Lawler, 1970; Parasuraman & Alutto, 1981; Schuler, 1977). Thus the set of role-related variables examined in this study included job level, reflecting the vertical differentiation of roles; leadership attention, representing supportive leadership; and five task characteristics: autonomy, closeness of supervision, complexity, interdependence, and routinization.

### Personal

Beehr and Newman (1978) and Van Sell et al. (1981), among others, have emphasized the role of personal characteristics in influencing both the focal person's perceptions of stressors as well as reactions to them. Based on previous findings and/or suggestions, three personality or quasi-personality dimensions were examined to assess the differential sensitivity of individuals

to stress situations. They were locus of control (Beehr & Newman, 1978; Beehr & Schuler, 1982); trait anxiety (McGrath, 1970; Spielberger, 1966); and job involvement (Weissenberg & Gruenfeld, 1968). Additionally, age, sex, educational level, and organizational tenure were included as relevant demographic characteristics (Alutto, Hrebiniak, & Alonso, 1970; Beehr & Schuler, 1982; Indik, Seashore, & Slesinger, 1964; Rizzo, House, & Lirtzman, 1970).

### Job Stressors

In this paper, job stressors were viewed as situational factors potentially capable of producing stress reactions. Following Parasuraman and Alutto (1981), stressors were defined conceptually as job demands, constraints (or opportunities), and job-related events or situations that may affect an individual's role fulfillment. As such they constitute potential sources of felt stress. Thus it was recognized that situations are not in themselves "stressful," but they may be so, depending on how individuals "receive" the demand and the meaning that they attribute to the situation. Based on the research of Parasuraman and Alutto (1981), seven situational stressors were investigated in this study: interunit conflict; technical problems; efficiency problems; role frustration; staff shortages; short lead times; and too many meetings.

### Attitudinal Outcomes

Felt stress was examined as the primary psychological response of individuals to job stressors. Felt stress was defined conceptually as the psychological response state of disturbed affect experienced by an individual in relation to various job demands or constraints encountered in the work environment. The experience of stress has been found to influence the focal individual's level of job satisfaction and commitment to the organization (Bedeian & Armenakis, 1981; Beehr & Newman, 1978; Hrebiniak & Alutto, 1972; Van Sell et al., 1981). Hence job satisfaction and organizational commitment were investigated as second level attitudinal outcomes of importance.

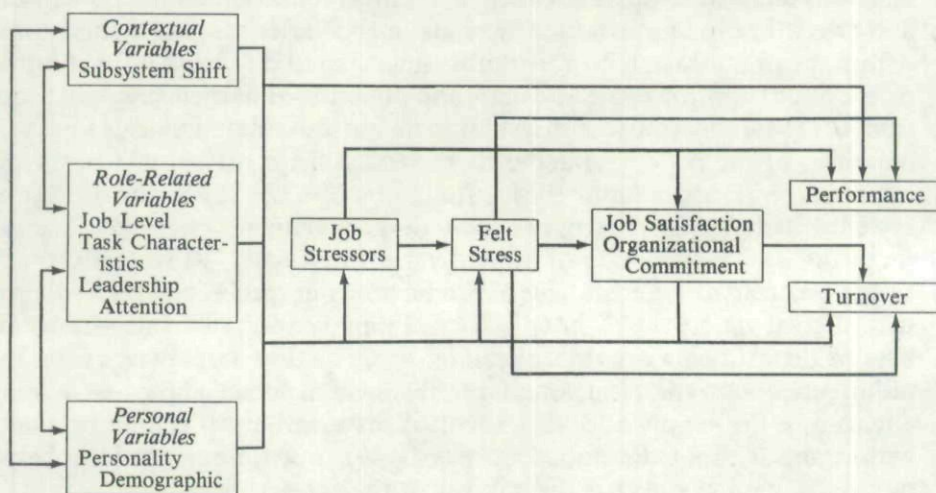
### Behavioral Outcomes

It is generally believed that stress impairs performance, but the evidence provided by field studies (Buck, 1972; Hall & Lawler, 1970; Sheridan & Vredenburgh, 1979) is both sparse and mixed. Some researchers have reported that job stressors and experienced stress are related to turnover (Brief & Aldag, 1976; Gupta & Beehr, 1979). Additionally, job satisfaction and organizational commitment have been found to be important attitudinal factors related to voluntary job termination (Porter, Steers, Mowday, &

Boulian, 1974; Steers, 1977). Performance and turnover were thus investigated as salient behavioral outcomes of various organizational properties and individuals' affective reactions to them.

The pattern of relationships among the different sets of variables in the system is specified in the model presented in Figure 1. It should be noted that the model is recursive; that is to say, the causal flow in the system is assumed to be unidirectional with no reciprocal causations or feedback loops. In terms of the model, contextual, role-related, and personal variables represent the exogenous variables in the system and are assumed to be predetermined. The remaining variables in the model are endogenous, that is, they are considered to be dependent, and their total variation is assumed to be determined by some linear combination of the variables in the system. Job stressors constitute the first level endogenous variables, which are posited to be influenced by antecedent contextual and role-related variables and by personal attributes. Consistent with McGrath's (1976) conceptualization of stress as a response state of arousal, felt stress was treated as a primary psychological outcome directly related to stressor conditions, and both directly and indirectly influenced by the set of exogenous variables. Felt stress, in turn, was posited to be an intervening variable influencing the attitudinal outcomes of job satisfaction and organizational commitment (Bedeian & Armenakis, 1981; Hrebiniak, & Alutto, 1972; Kahn et al., 1964) and, eventually, turnover. Of the two behavioral outcomes examined in relation to individuals' organizational experiences, performance was posited to be influenced most immediately by felt stress (Buck, 1972; Sheridan & Vredenburg, 1979). No direct effects were posited for satisfaction on performance, because of the equivocal results concerning the satisfaction-performance relationship reported in previous research (Schwab

**Figure 1**  
**Structural Model of the Causes and Consequences of Stress**



& Cummings, 1970) and recent findings that the relationship is reciprocal and mediated by rewards and other factors (Jacobs & Solomon, 1977; Terborg, Richardson, & Pritchard, 1980). The absence of previously demonstrated relationships between commitment and performance (Steers, 1977) provided the rationale for the exclusion of a commitment-performance link. Consistent with recent findings (Hom, Katerberg, & Hulin, 1979; Porter et al., 1974; Steers, 1977), job satisfaction and organizational commitment were treated as proximal determinants of turnover. Both performance and turnover also were assumed to be influenced directly and indirectly by stressors and the exogenous variables.

## Method

### Data Collection and Sample

The data for this study were gathered from a medium-sized food processing company. Questionnaires were administered at the work site and completed by 217 persons representing 86 percent of all employees. Of the respondents, 38 occupied managerial and supervisory positions; the rest were in clerical and blue-collar production-related jobs. Of the respondents, 67 percent were male and 33 percent female. Managerial and supervisory personnel also completed a short questionnaire concerning their evaluation of the work performance of each of their subordinates. Turnover data and information pertaining to the job title/rank and organizational location of each individual were obtained from organization records.

### Measures

*Subsystem.* Katz and Kahn's (1966) scheme of generic types of subsystems was adapted to operationalize this contextual variable. The researchers and two other judges assigned subjects in the various departmental units within the organization into five subsystems based on their role in the production/distribution cycle and common dimensions in their primary functions: (1) Administrative subsystem included the "management group," members of the personnel department, and general office staff performing managerial and administrative functions ( $n = 32$ ); (2) Production subsystem 1 included employees in production departments engaged in manufacturing a single product, of limited variety ( $n = 64$ ); (3) Production subsystem 2 consisted of individuals in production units processing several products of great variety ( $n = 34$ ); (4) Technical support subsystem included members of departments providing maintenance, quality assurance, and sanitation services ( $n = 44$ ); (5) Boundary subsystem included employees in units engaged in the supply and movement of materials and finished products within and without the organization ( $n = 43$ ). For all units at least three of the four judges placed the subject in the same subsystem category.

Tell what  
it came from

Broken  
into 5  
Subsystem

*Shift.* The dimension of work shift included two categories, first and second shift. A third shift, which partially overlapped with the second shift, included only 12 individuals working in the sanitation department. These 12 persons were grouped with the second shift for the purposes of this study.

*Job Level.* The organization's ratings of the vertical dimensions of jobs, based on responsibility and authority, as well as education and/or training required, were used to assign the subjects into three job level categories: (1) high level (e.g., managers and supervisors) ( $n = 38$ ); (2) medium level (e.g., computer technicians, salesmen, group leaders, machine operators) ( $n = 95$ ); (3) low level (e.g., clerks, utility workers, machine cleaners) ( $n = 84$ ). This classification reflects the organization's assessment of the labor value of different positions and recognized status differentials among job types.

*Task Characteristics.* The five task characteristics were measured by scales used by Parasuraman and Alutto (1981): (1) Autonomy, reflecting the degree of freedom built into the job, was measured by a 4-item scale; (2) Closeness of supervision was measured by three items indicating the extent of supervisory influence and control on an individual's daily work; (3) Complexity was a 3-item scale reflecting the training and communications requirements of the job and the degree of complexity of the work itself; (4) Interdependence was measured by two items denoting the functional interrelatedness of jobs; (5) Routinization was a 2-item scale reflecting the degree of repetitiveness of tasks and the extent to which they were governed by rules and regulations.

*Leadership Attention.* Dansereau's (1972) leadership attention scale was used to assess the immediate supervisor's behavior towards a focal role performer.

*Locus of Control.* A modified version of Rotter's (1966) I-E scale incorporating the items found to be work-related (Valecha, 1972) was used to measure locus of control. The 7-item scale was scored in the direction of increasing external locus of control.

*Trait Anxiety.* This characteristic was assessed by a modified short form (Bendig, 1956) of the Taylor (1953) manifest anxiety scale.

*Job Involvement.* This construct was operationalized by a 3-item measure derived from the original Lodahl and Kejner (1965) scale.

Measures of the demographic characteristics of interest were obtained by means of single item questions asking respondents to indicate their sex, age, and level of education attained. Length of tenure in the organization was assessed from self-reports and confirmed from organizational records.

*Job Stressors.* The seven situational stressors were operationalized by means of the scales developed by Parasuraman and Alutto (1981). Interunit conflict was measured by four items reflecting communication difficulties, poor interdepartmental cooperation, and overlapping responsibilities. Technical problems consisted of three items indicating resource inadequacies such as equipment breakdowns and defective materials and supplies. Efficiency problems were a 2-item scale reflecting difficulties in achieving productivity standards. Role frustration was a 4-item scale denoting work

overload, low status, inadequate supervisory instruction, and favoritism. Staff shortages, short lead times, and the stressor of too many meetings, were assessed by single items, reflecting inadequacy of human resources, rush jobs under tight deadlines, and time pressures, respectively.

*Felt Stress.* This attitudinal outcome was operationalized by a 9-item scale developed by Parasuraman (1982).

*Job Satisfaction.* The Job Descriptive Index constructed by Smith, Kendall, and Hulin (1969) was used to measure job satisfaction.

*Organizational Commitment.* This attitudinal outcome was assessed by the 4-item scale developed by Alutto, Hrebiniak, and Alonso (1973).

*Performance.* Job performance was measured by a scale based on supervisory ratings of the quantity and quality of work, and overall job performance of each subordinate.

*Turnover.* Company records indicated that 28 persons or 12.9 percent of the respondents had voluntarily terminated their employment in the organization during the one year period following the survey. Voluntary turnover was measured by a dichotomous variable indicating whether respondents had resigned or remained with the organization at the end of one year after the questionnaire was administered.

The means, standard deviations, and scale reliabilities of the measured variables are reported in Table 1.

**Table**  
**Matrix of Pooled Within-Group Correlations of System Variables**

Variable	$\bar{X}$	SD	1	2	3	4	5	6	7	8	9
1. Shift (Dummy: 1 = 1st shift)											
2. Autonomy	12.37	3.81	.11	.76							
3. Closeness of supervision	9.91	2.75	.01	-.08	.71						
4. Complexity	10.18	2.77	.13	.11	.20	.71					
5. Interdependence	7.12	2.19	-.11	.05	.11	.26	.62 <sup>b</sup>				
6. Routinization	7.49	1.77	.06	-.01	.14	.21	.23	.49 <sup>b</sup>			
7. Leadership attention	24.17	7.72	.02	.23	.20	.07	.13	-.06	.88		
8. Anxiety	7.14	1.58	.13	.02	.02	.19	-.05	.07	-.08	.65	
9. Locus of control	2.56	1.82	.06	-.12	.0	.06	-.09	.10	-.20	.17	.64
10. Job involvement	8.04	2.00	.06	.09	.06	.02	.08	-.05	.15	.10	-.17
11. Sex (1 = male; 2 = female)	1.33	.47	-.04	.11	-.14	-.12	-.05	-.11	.03	-.06	.08
12. Age	37.96	12.95	.14	.01	.02	-.09	.06	.01	.03	-.07	-.09
13. Education	3.26	1.66	-.09	-.11	.09	.23	.07	.09	-.07	-.01	-.07
14. Organizational tenure	7.29	6.98	.27	.15	-.02	.03	.12	.13	-.09	.03	-.06
15. Interunit conflict	19.06	5.93	.13	.0	.12	.20	.04	.12	-.15	.25	.27
16. Technical problems	14.87	4.32	-.01	.0	.19	.20	.16	.09	.02	.23	.05
17. Efficiency problems	10.15	3.10	.02	-.19	.13	.21	.20	.13	-.05	.24	.01
18. Role frustration	17.84	6.56	.10	-.01	.12	.19	.04	.16	-.34	.34	.26
19. Staff shortages	5.00	1.88	.04	.05	.08	.11	.02	.13	-.14	.15	.07
20. Short lead times	4.75	1.99	.15	.05	.12	.12	-.01	.06	-.08	.22	.21
21. Too many meetings	3.03	1.43	.15	.01	.09	.07	.04	-.09	.02	.16	.14
22. Felt stress	21.22	8.18	.08	.20	.11	.27	.01	.12	-.13	.46	.24
23. Job satisfaction	125.91	34.65	.04	.29	.08	-.08	.04	-.14	.50	-.28	-.39
24. Organizational commitment	8.67	2.75	.04	.21	-.07	-.06	.06	-.09	.25	-.22	-.20
25. Rated performance	11.59	2.17	.09	-.03	-.08	-.04	.05	.05	.12	-.17	-.02
26. Turnover	.13	.34	.02	-.19	-.09	.10	-.12	.0	-.07	.12	-.05

<sup>a</sup>Decimals omitted for variables (correlation of .11 is significant at the .05 level); figures on the diagonal are scale reliabilities ( $\alpha$ ).

<sup>b</sup>Item intercorrelation.

**Data Analysis**

A two-step analytical sequence, consisting of multivariate analysis of variance (MANOVA) and path analysis using least squares multiple regression, was employed in testing the tenability of the proposed model and assessing the linkages among the system variables. In view of the methodological constraints and problems involved in applying regression and path analysis techniques to multicategory ordinal variables (Heise, 1969; Land, 1969; Lyons, 1971), the effects of the contextual and role-related variables of subsystem and job level on the remaining variables in the system had to be assessed separately. Accordingly, the MANOVA procedure was utilized to determine the effect of subsystem and job level, respectively, on stressors and the various attitudinal and behavioral outcomes. The two variables, subsystem and job level, then were statistically controlled for by computing pooled within group correlations adjusted to separate subgroup means (Finn, 1974). This procedure eliminated the possibility of confounding the results due to systematic variation in the measured variables among different subsystems and job level categories. The pooled within-group correlations (Table 1) were used as data input for the stepwise multiple regression analysis performed to compute the path coefficients for each of the assumed causal links in the system.

**1  
Adjusted for Subsystem and Job Level<sup>a</sup>**

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
.75																
-15	—															
43	-22	—														
-22	04	-27	—													
18	-04	54	-30	—												
-14	04	-20	17	-03	.74											
-18	07	-27	06	-16	43	.68										
-06	-04	-05	04	01	38	42	.62 <sup>b</sup>									
-22	-10	-14	03	01	60	41	42	.76								
-10	10	-17	-06	01	44	35	40	49	—							
-10	06	-12	05	01	58	32	29	53	43	—						
01	17	0	-09	08	26	26	17	27	24	29	—					
-20	04	-22	15	02	27	27	24	24	28	42	18	.93				
32	-04	18	-21	12	-20	-20	-17	-17	-20	-25	-02	-52	.91			
22	06	22	-12	19	-17	-17	-13	-13	-21	-25	02	-33	44	.88		
13	-13	13	-06	-01	-09	-09	-07	-07	-18	-20	-10	-21	13	05	.85	
01	-11	-12	03	-07	02	02	10	10	11	10	-01	23	-06	-23	-02	—



In applying path analysis procedures, it was recognized that all of the assumptions underlying such analysis (Billings & Wroten, 1978; Heize, 1969; James, 1980) may not be met fully in this study. Although the robustness of the  $F$  and  $t$  tests used in multiple regression analysis makes them resistant to minor violations of the assumptions (Kerlinger & Pedhazur, 1973), care was taken to minimize relaxations of the assumptions. First, the correlations among the exogenous variables were examined to check for possible multicollinearity (Gordon, 1968). The correlations among the three sets of exogenous variables ranged from 0 to .51; the median intercorrelation was .09. Second, in view of the theoretical proposition of an *inverted U* relationship between experienced stress and level of performance (McGrath, 1970), a scattergram was plotted to test for possible curvilinearity in the relationship between felt stress and rated performance. The results showed a weak negative relationship between felt stress and performance, but no evidence of an inverted U phenomenon.

## Results

The results of the MANOVA performed to assess the effects of subsystem and job level on the system variables indicated significant main effects for both subsystem and job level on four of the seven stressors: technical problems, efficiency problems, role frustration, and too many meetings. Additionally, job level had a significant main effect on the stressor of short lead times. With regard to the outcome measures, job satisfaction and organizational commitment shared the main effects of subsystem and job level; subsystem also had a significant main effect on rated performance.

The individual and joint contributions of subsystem and job level to variations in the dependent measures for which significant main effects were found were assessed by means of multiple classification analysis (MCA) (Kim & Kohout, 1975). The results showed that subsystem had a greater impact than did job level on the stressors of technical problems ( $\beta = .45$  vs.  $\beta = .16$ ) and efficiency problems ( $\beta = .27$  vs.  $\beta = .19$ ), as well as on rated performance ( $\beta = .31$  vs.  $\beta = .09$ ). In contrast, job level impacted more strongly on organizational commitment ( $\beta = .36$ ) than did subsystem ( $\beta = .22$ ). The total or joint effects of subsystem and job level ranged from 6 percent to 24 percent. The amount of variance explained was highest with regard to job satisfaction ( $R^2 = .24$ ), followed by organizational commitment ( $R^2 = .21$ ), and the stressor of technical problems ( $R^2 = .21$ ).

Given the observed differences in the dependent measures across subsystems and job levels highlighted by the MANOVA results, pooled within-group correlations controlling for the effects of subsystem and job level were used to perform the multiple regression analysis and determine the path coefficients for the 12 structural equations representing the model. Table 2 presents a summary of the regression results and the path coefficient representing the direct effects of the predictor variables on each of the dependent measures. The data show that the model as a whole (after

controlling for subsystem and job level) explained 21 percent of the variance in voluntary turnover and 18 percent in rated performance. With regard to the intermediate outcomes, the causally prior variables accounted for 49 percent of the variance in felt stress, 60 percent of the variance in job satisfaction, and 29 percent of organizational commitment. The antecedent contextual, personal, and role-related variables accounted for 13 to 36 percent of the variation in job stressors.

In order to trim the model and make it more parsimonious, the nonsignificant path coefficients in Table 2 were set equal to zero, and the reduced structural equations were reanalyzed according to the procedure specified by Heise (1969). Four of the seven stressors had no significant effects on any of the outcome measures, and they were excluded from further analysis. This resulted in a model consisting of 7 structural equations with 30 direct paths. The results of the reanalysis of the reduced model showed that antecedent variables explained 54 percent of the variance in felt stress, 46 percent of job satisfaction, and 15 percent of the variation in commitment (see Table 3). The explained variance for performance and turnover was 8 percent and 17 percent, respectively (see Table 4). The exogenous variables accounted for 31 percent of the variance in role frustration and 12 percent of the variance in short lead times. Sheaf coefficients (Heise, 1972) were computed to assess the combined effect of the statistically significant role-related and personal variables as well as job stressors on felt stress, job satisfaction, organizational commitment, and turnover. The sheaf coefficients for personal and role-related variables on felt stress were .32 and .24, respectively; the joint influence of role frustration and short lead times was .40. The influence of personal variables as a whole on job satisfaction was .25 and on organizational commitment was .30. The role-related variables had a combined effect of .13 on turnover; felt stress and organizational commitment jointly contributed .26 to turnover.

The figures reported in Tables 3 and 4 illustrate the decomposition of the total effects into constituent direct, indirect, and spurious or noncausal effects (Alwin & Hauser, 1975; Ross, 1975). The results indicate that 25 of the 30 direct paths were significant at the .05 level or better. Role frustration and short lead times were the principal stressors, indicating that work overload, low status, and excessive time pressures are key elements contributing to the experience of stress. Trait anxiety ( $p = .35$ ) and closeness of supervision ( $p = .19$ ) made a positive contribution to the perceived prominence of role frustration; on the other hand, job involvement ( $p = -.21$ ) and leadership attention ( $p = -.30$ ) reduced the perceived magnitude of this stressor. The stressor of short lead times was positively influenced by three exogenous factors—closeness of supervision ( $p = .14$ ), anxiety ( $p = .19$ ), and external locus of control ( $p = .18$ ).

A number of exogenous variables impacted directly and indirectly on felt stress. It may be seen that role frustration had a somewhat greater capacity to induce felt stress ( $p = .27$ ) than did short lead times ( $p = .19$ ). The power of trait anxiety to engender feelings of stress and psychological strain

**Table**  
**Summary of Stepwise Multiple Regression Results:**  
**and Attitudinal and**

Variables	Independent Effect of Added Variables						
	Job Stressors						
	Interunit Conflict	Technical Problems	Efficiency Problems	Role Frustration	Staff Shortages	Short Lead Times	Too Many Meetings
Shift (Dummy: 1 = 1st shift)	07	0	0	07	03	11	13
Autonomy	02	-01	0	-13*	-02	08	-04
Closeness of supervision	17*	18**	11	14*	10	15**	12
Complexity	05	08	10	10	07	02	04
Interdependence	09	19**	18**	09	02	02	11
Routinization	-03	0	04	03	10	-02	-15*
Leadership attention	-15*	-03	-07	-28***	-14	-08	01
Sex (Dummy: 1 = male)	0	06	01	-07	11	04	19*
Age	-16*	-15	01	-08	-19*	-08	-01
Education	15*	-04	-02	-06	-13	03	-07
Organizational tenure	-02	-13	-02	02	06	01	04
Anxiety	21**	25***	24***	28***	10	19**	14
Locus of control	17*	-04	-05	12	-01	14*	12
Job involvement	-08	-16*	-10	-20**	-04	-08	-01
Interunit conflict							
Technical problems							
Efficiency problems							
Role frustration							
Staff shortages							
Short lead time							
Too many meetings							
Felt stress							
Job satisfaction							
Organizational commitment							
R <sup>2</sup>	26***	22***	14*	36***	13*	15**	13*

<sup>a</sup>Decimals omitted.

\* $p \leq .05$

\*\* $p \leq .01$

\*\*\* $p \leq .001$

was reflected in its direct effect on felt stress ( $p = .31$ ) as well as in its indirect influence through role frustration and short lead times. The task characteristic of complexity tended to heighten the experience of stress ( $p = .14$ ) slightly. On the other hand, increased job autonomy ( $p = -.19$ ) and age ( $p = -.13$ ) tended to reduce the severity of felt stress. Leadership attention, job involvement, locus of control, and closeness of supervision had indirect effects on felt stress through their influence on role frustration and short lead times.

As posited by the model, felt stress directly influenced individuals' affective reactions toward their jobs and decreased job satisfaction ( $p = -.32$ ), as was the case with the stressor of role frustration ( $p = -.15$ ). Leadership attention had a direct and positive effect ( $p = .37$ ) on job satisfaction.

## 2

**Direct Effect of Antecedent Variables on Job Stressors, Behavioral Outcomes<sup>a</sup>***(Standardized Net Regression Weights)*

<i>Attitudinal and Behavioral Outcomes</i>					
<i>Felt Stress</i>	<i>Job Satisfaction</i>	<i>Organizational Commitment</i>	<i>Rated Performance</i>	<i>Turnover</i>	<i>Variables</i>
-04	02	04	-07	0	Shift (Dummy: 1 = 1st shift)
-19***	05	09	-08	-19*	Autonomy
04	-07	-06	-16*	-18*	Closeness of supervision
12*	04	02	04	12	Complexity
0	-02	-01	-01	-13	Interdependence
-02	-04	0	11	01	Routinization
07	35***	17*	16*	0	Leadership attention
-02	-11	08	-09	-07	Sex (Dummy: 1 = male)
-15*	-11	03	06	-11	Age
08	05	0	-10	06	Education
11	09	20*	-04	03	Organizational tenure
32***	-08	-16*	-16	-03	Anxiety
04	-16**	06	06	-13	Locus of control
12	13*	11	11	10	Job involvement
0	-12	-04	-22*	11	Interunit conflict
-04	-01	02	02	-08	Technical problems
-03	02	02	0	07	Efficiency problems
27**	-15*	-05	03	03	Role frustration
0	03	-09	-15	-01	Staff shortages
18***	06	-07	-14	-01	Short lead time
01	10	11	-02	-02	Too many meetings
	-30***	-09	-13	20*	Felt stress
				16	Job satisfaction
				-18*	Organizational commitment
49***	60***	29***	18*	21*	R <sup>2</sup>

Of the personal characteristics, job involvement ( $p = .15$ ) and organizational tenure ( $p = .12$ ) tended to enhance job satisfaction, and external locus of control diminished it ( $p = -.17$ ). The remaining exogenous variables affected job satisfaction largely indirectly through role frustration, short lead times, and felt stress. Organizational tenure ( $p = .22$ ) and leadership attention ( $p = .26$ ) were the primary factors contributing to increased commitment to the organization, whereas anxiety tended to reduce ( $p = -.22$ ) organizational commitment. Contrary to expectations, felt stress was causally unrelated to organizational commitment.

With regard to the behavioral outcomes, none of the antecedent variables had a significant direct effect on performance. Felt stress and organizational commitment were the two most immediate predictors of turnover;

felt stress contributed directly ( $p = .20$ ) to increased turnover, and organizational tenure ( $p = -.20$ ) diminished it. The decision to terminate also was

**Table 3**  
**Direct, Indirect, and Total Effects of Antecedent Variables on Job Stressors and Attitudinal Outcomes<sup>a</sup>**

Antecedent Variables	Job Stressors				
	Role Frustration		Short Lead Times		
	Direct Effect	<i>r</i>	Direct Effect	<i>r</i>	
Autonomy	-11	-19			
Closeness of supervision	19**	12	14**		12
Leadership attention	-30***	-34			
Anxiety	35***	34	19**		22
Locus of control			18**		21
Job involvement	-21***	-22			
R <sup>2</sup>	31***		12*		
Ratio of correlations duplicated within $\pm .10$	5/5		3/3		
Antecedent Variables	Felt Stress				
	Effect				
	Direct	Indirect	Total	Spurious	<i>r</i>
Autonomy	-19**	-01	-20	0	-20
Closeness of supervision		07	07	04	11
Complexity	14**	04	18	09	27
Leadership attention		-09	-09	-04	-13
Anxiety	31***	11	42	04	46
Locus of control		06	06	18	24
Job involvement	-12*	-06	-18	-02	-20
Age	-13*				
Organizational tenure		-03	-03	01	-02
Role frustration	27***		27	28	55
Short lead times	19**		19	23	42
R <sup>2</sup>	46***				
Ratio of correlations duplicated within $\pm .10$	8/11				
Antecedent Variables	Job Satisfaction				
	Effect				
	Direct	Indirect	Total	Spurious	<i>r</i>
Autonomy		08	08	21	29
Closeness of supervision		-06	-06	03	-03
Complexity		-07	-07	-01	-08
Leadership attention	37***	04	41	09	50
Anxiety		-21	-21	07	-28
Locus of control	-17**	-04	-21	18	-39
Job involvement	15**	08	23	09	32
Age		05	05	13	18
Organizational tenure		13	13	-01	12
Role frustration	-15*	-07	-22	-30	-52
Short lead times		-05	-05	20	-25
Interunit conflict		-10	-10	-02	-12
Felt stress	-32***		-32	20	-52
R <sup>2</sup>	54***				
Ratio of correlations duplicated within $\pm .10$	7/13				

<sup>a</sup>Decimals omitted.

\* $p < .05$

\*\* $p < .01$

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

Table 3 (continued)

Antecedent Variables	Organizational Commitment				r
	Direct	Indirect	Total	Spurious	
Autonomy		2	12	09	21
Closeness of supervision		-11	-11	03	-08
Complexity		-03	-03	02	05
Leadership attention	26***	02	28	-03	25
Anxiety	-20**	-03	-23	01	-22
Locus of control		-07	-07	-13	-20
Job involvement		13	13	09	22
Age		07	07	15	22
Organizational tenure	22**	-03	19	0	19
Role frustration		-10	-10	-25	-35
Short lead times		-12	-12	-13	-25
Interunit conflict		-03	-03	-14	-17
Felt stress		-10	-10	-23	-33
R <sup>2</sup>	15*				
Ratio of correlations duplicated within $\pm .10$	7/13				

<sup>a</sup>Decimals omitted.

\* $p < .05$

\*\* $p < .01$

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

directly influenced by autonomy ( $p = -.13$ ). Contrary to expectations, job satisfaction had no effect on voluntary job termination by the focal role performer.

The large sample chi square test (Joreskog & Sorbom, 1978; Kim & Kohout, 1975) was performed to determine the adequacy of the restricted model. The results showed that the full and reduced models did not differ significantly in their ability to explain variance in the outcome measures. As a further measure of the "goodness of fit" of the reduced model, the estimated correlations as represented by the sum of the direct and indirect effects were examined to assess the extent to which they were consistent with the original correlations between the predictor variables and the dependent measures (Billings & Wroten, 1978; Kerlinger & Pedhazur, 1973). Applying the criterion that the absolute difference between the reproduced and original correlation does not exceed .10 (Martin, 1981; Namboodiri, Carter, & Blalock, 1975), the data showed that the reduced model duplicated all five correlations for role frustration and all of the correlations for short lead times. A smaller proportion of correlations was reproduced for felt stress (7 out of 11). For job satisfaction and organization commitment respectively, 7 of 13 of the reconstructed correlations were consistent with the original coefficients. For performance, 11 of 13 correlations were duplicated; for turnover 13 of 14 reconstructed correlations fell within the limits specified.

## Discussion

Overall, the results of this study provided moderate support for a multi-dimensional model of stress and yielded valuable insights into the etiology

**Table 4**  
**Direct, Indirect, and Total Effects of Antecedent Variables on Behavioral Outcomes<sup>a</sup>**

Antecedent Variables	Rated Performance						Turnover					
	Effect			r			Effect			r		
	Direct	Indirect	Total	Spurious	Total	r	Direct	Indirect	Total	Spurious	Total	r
Autonomy												
Closeness of supervision												
Complexity												
Leadership attention												
Anxiety												
Locus of control												
Job involvement												
Age												
Organizational tenure												
Role frustration												
Short lead times												
Interunit conflict												
Felt stress												
Organizational commitment												
R <sup>2</sup>												
Ratio of correlations duplicated within ±.10												

<sup>a</sup>Decimals omitted.

\* $p < .05$

\*\* $p < .01$

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

of work-related stress and its consequences for the individual and the organization. The data revealed that both contextual and role-related variables, as represented by subsystem and job level, respectively, independently contributed to variation in job attitudes and behavior, as well as the reported magnitude of job stressors. It appears, therefore, that individuals' perceptions of work-generated stressors and their eventual reactions to these organizational realities are importantly influenced by their location within a particular organizational space. These findings tend to confirm theoretical propositions (Katz & Kahn, 1966; McGrath, 1976) concerning the importance of contextual and role-related referents in indexing members' work experiences and are consonant with previously reported results (Adams et al., 1977; Parasuraman & Alutto, 1981).

The path analysis results provided tentative evidence concerning the logical consistency of the posited structural model and, in general, indicated qualified support for the assumed causal pattern of relationships among the system variables. Personal variables were found to influence stressors directly and somewhat more strongly than role-related variables. The role of trait anxiety in enhancing the perceived magnitude of stressors was demonstrated by its positive effect on both role frustration and short lead times. The finding that external locus of control increased the perceived prominence of short lead times demonstrates the role of employees' attributions of responsibility on perceptions of environmental stressors (Behr & Newman, 1978). In contrast, job involvement tended to diminish role frustration, suggesting that ego involvement with work serves to temper the adverse perceptions of work overload and low status. The negative effect of leadership attention on role frustration indicated the buffering impact of supportive supervisory behavior on the perceived prominence of stressors. Closeness of supervision, which may tend to limit individuals' behavioral options, served to increase role frustration. Thus, as suggested by Buck (1972) and McLean (1979), it appears that it is the perceived lack of individual control that renders particular situations stressful.

As predicted, both role frustration and short lead times directly contributed to the experience of stress as demonstrated by their positive effects on felt stress. Among exogenous variables, the greater sensitivity of anxious individuals to environmental stressors was manifested in the strong contribution of trait anxiety to felt stress. This finding is similar to the results reported by Kahn and his associates (1964) concerning the role of neurotic anxiety in modifying reactions to role conflict and role ambiguity. The negative effect of age on felt stress indicates that increased maturity generally associated with age tends to enhance the stress-tolerance ability of individuals. It appears that older individuals may have developed coping mechanisms for dealing with stressors, whereas younger persons may be less skilled in coping due to their shorter period of work experience. It also is possible that age has a leveling effect in that it results in a downward adjustment of expectations concerning job conditions, or that older persons just accept stressful conditions as a fact of organizational life. The finding that

Age = less skill  
?



autonomy decreased felt stress indicates that increased role latitude may enable individuals to deal more effectively with stressful work experiences. On the other hand, the direct effect of complexity on felt stress observed in this study suggests that this task characteristic may itself be a stressor (Caplan et al., 1975).

A major finding of this study was that felt stress and low organizational commitment directly contributed to voluntary termination of employment. This finding partially confirms previously reported studies suggesting that commitment may prove to be a better predictor of turnover than job satisfaction (Hom et al., 1979; Porter et al., 1974). The results would seem to support Porter et al.'s (1974) contention that organizational commitment is a more global and enduring evaluative response to the organization as a whole than job satisfaction, which may be a more transitory affective reaction to a particular job. Thus job dissatisfaction may reflect a rejection of the job, but not necessarily of the organization. As a result, low commitment to the organization is likely to be a more potent contributor to the decision to terminate than job dissatisfaction.

Felt stress was not found to be causally linked to commitment as was expected from previous findings (Bedeian & Armenakis, 1981; Hrebiniak & Alutto, 1972). Yet both stress and commitment independently contributed to voluntary severance of the employment relationship. This suggests that withdrawal from the organization is an impulsive and emotionally generated behavioral response to high experienced stress or psychological strain. On the other hand, voluntary termination also is a considered behavioral response based on low stakes in the organization (Hrebiniak & Alutto, 1972).

The results of this study demonstrate the utility of investigating both macro and micro aspects of the organization in gaining a more comprehensive understanding of the precursors and consequences of work-related stress. The results must be interpreted cautiously, however. Given the use of self-reports to measure many of the variables employed in this study, it is acknowledged that common method variance may have accounted for some of the observed relationships among the system variables. Although the formal test of significance revealed no difference between the full and reduced models in their ability to explain variance in the dependent measures, the marked decline in the percentage of variance explained in organizational commitment (29 to 15) and performance (18 to 8) in the restricted model suggests that possibly some paths that should have been retained were deleted (Billings & Wroten, 1978). Thus, in theory trimming it may be useful to combine the criterion of statistical significance with that of meaningfulness for selecting paths to be retained (Kerlinger & Pedhazur, 1973; Land, 1969). Furthermore, the decomposition of the path coefficients into constituent direct and indirect effects indicated a somewhat low level of correspondence between some of the reconstructed and original correlations (for example, role frustration with felt stress, job satisfaction, and commitment). This suggests that part of the original relationship was spurious; that is to say, part of the original zero-order correlation was the result of the joint

effect of causally prior variables (Ross, 1975). Other explanations include the possibility of correlated residuals, incorrect ordering of the variables, and unmeasured variables (Billings & Wroten, 1978; James, 1980; Kerlinger & Pedhazur, 1973). Multicollinearity among some of the variables (e.g., stressors) and the modest reliability of some measures may be additional limitations. Nevertheless, the path analysis of the structural model provides important insights into the internal dynamics of the system and represents a starting point for additional research using multivariate causal models. Based on the findings of this study, however, some modifications to the model appear indicated in order to enhance its explanatory power with regard to the phenomena of interest. The key changes suggested pertain to the role of the first and second level outcomes in relation to voluntary turnover. Thus it is proposed that felt stress and organizational commitment be regarded as critical personal outcomes that directly and independently contribute to the decision to terminate employment. In contrast, job satisfaction might be viewed as an alternative second level outcome, unrelated to turnover. This reordering acknowledges the importance of job satisfaction as a personal outcome but recognizes that, as a short term and potentially changeable attitude, it may not be sufficient to induce voluntary separation.

Given that the stress-performance relationship, though nonsignificant, was in the expected direction, it is suggested that performance be retained as a salient organizational outcome. The weak relationship between felt stress and performance found in this study was due possibly to the assembly line operations in which a large proportion of the subjects were working, and the consequent low variation in individual performance. Another possible explanation is that for individuals who had developed adaptive coping mechanisms, the experience of stress had little effect on performance. This suggests that the stress-performance relationship may be mediated by the effectiveness of the coping mechanisms evoked. Thus it is possible that under certain circumstances, felt stress may be accompanied by high performance.

The present study provides a useful starting point toward the development of tenable multivariate causal models of stress, its antecedents and outcomes in organizations. It also demonstrates the value of objective measures of behavior—in this case, turnover—in assessing the predictive utility of perceptually based measures. The results serve also to underscore the need for developing appropriate research designs for longitudinal research in order to capture more effectively the dynamic processes involved in the generation of stressors at work and employees' reactions to them.

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