

ORIGINAL RESEARCH

A Defining Aspect of Human Resilience in the Workplace: A Structural Modeling Approach

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ABSTRACT

Objectives: It has been estimated that up to 90% of the US population is exposed to at least 1 traumatic event during their lifetime. Although there is growing evidence that most people are resilient, meaning that they have the ability to adapt to or rebound from adversity, between 5% and 10% of individuals exposed to traumatic events meet criteria for posttraumatic stress disorder. Therefore, identifying the elements of resilience could lead to interventions or training programs designed to enhance resilience. In this article, we test the hypothesis that the effects of stressor conditions on outcomes such as job-related variables may be mediated through the cognitive and affective registrations of those events, conceptualized as subjective stress arousal.

Methods: The subjects were 491 individuals employed in public accounting, who were sampled from a mailing list provided by the American Institute of Certified Public Accountants. The stressors used in this study were role ambiguity, role conflict, and role overload and the outcome measures were performance, turnover intentions, job satisfaction, and burnout. Stress arousal was measured using a previously developed stress arousal scale. We conducted a series of 2 EQS structural modeling analyses to assess the impact of stress arousal. The first model examined only the direct effects from the role stressors to the outcome constructs. The second model inserted stress arousal as a mediator in the relations between the role stressors and the outcomes.

Results: The results of our investigation supported the notion that subjective stress arousal provides greater explanatory clarity by mediating the effects of stressors upon job-related outcome. Including stress arousal in the model provided a much more comprehensive understanding of the relation between stressor and outcomes, and the contribution of role ambiguity and role conflict were better explained.

Conclusions: By understanding these relations, anticipatory guidance and crisis intervention programs can be designed and implemented to enhance human resilience. These data could serve to improve training programs for these “at risk” professional groups or even the population as a whole.

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Key Words: resilience, posttraumatic stress disorder, stress arousal, job satisfaction, job performance, modeling

In 2006, more than 6 million violent crimes were committed in the United States,¹ and nearly 90% of people are exposed to at least 1 traumatic type of event during their lifetime.² Moreover, current estimates suggest that 5% to 10% of those exposed to traumatic events will meet diagnostic criteria for posttraumatic stress disorder (PTSD).³ These daunting figures attest to the regrettable exposure and potential suffering that traumatic events may cause. Recognition is growing, however, that most people exposed to traumatic or stressful life events do not experience serious disruptions in normal life functioning.⁴ These individuals may be considered to be exhibiting what is commonly referred to as resilience. Resilience may be thought of as the ability to adapt to or rebound from adversity. Therefore, it seems that there would be value in identifying the operational or tactical elements of human resilience so that interventions or training programs designed to enhance resilience may be better guided or informed. This article represents an attempt to test a founda-

tional hypothesis regarding human resilience. More specifically, we test the hypothesis that the effects of stressor conditions upon select measurable outcomes such as burnout and job-related variables may be mediated through the cognitive and affective registrations (referred to as stress arousal herein) of those events in addition to any direct effects those conditions may exert.

RESILIENCE

Reivich and Shatte define resilience as the ability to “persevere and adapt when things go awry,” and suggest that the construct is associated with one’s ability to cognitively appraise a situation.⁵ Bonanno defines resilience as “the ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially disruptive event, such as the death of a close relation or a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning.”⁶ Kaminsky et al propose a tripartite model of disaster mental health that breaks down

resilience into resistance, which they conceptualize broadly as protective factors or immunity, and resilience that they define as “the ability of an individual, a group, an organization, or even an entire population, to rapidly and effectively rebound from psychological and/or behavioral perturbations associated with critical incidents, terrorism, and even mass disaster.”⁷

Empirical Evidence of Stressful Life Events, Disasters, and Resilience

Researchers have investigated various protective factors that foster resilience in people exposed to stressful life occurrences, with the bulk of this formative research being conducted on grieving individuals following the loss of a loved one.⁸⁻¹⁰ In a longitudinal study by Bonnano and colleagues that began several years before the death of a spouse and continued for several years after the death of the spouse, 46% of the participants demonstrated no clinical depression at any time during the study.¹¹ Moreover, in a study that compared younger (younger than 65 years) bereaved adults after the death of a spouse or a child with a matched group of nonbereaved individuals (those with intact marriages), 52% of the bereaved individuals were considered resilient (defined as scoring within 1 standard deviation of the nonbereaved group’s mean on assessed symptom levels) at both 4 and 18 months postloss.¹² In fact, by 18 months postloss, resilient individuals were equivalent to nonbereaved individuals on the symptom ratings.¹²

Some researchers have explored the resilience of individuals exposed to disasters, such as the aftermath of the terrorist attacks of September 11, 2001.¹³⁻¹⁵ In a study that used a representative sample of 2752 New York residents, more than 65% of the participants met the criteria for resilience, defined as having no or only 1 PTSD symptom.¹³ Moreover, more than half of the sample involved in the rescue efforts at the World Trade Center was resilient, as was close to 54% of the sample who experienced the death of a friend or relative as a result of the attacks.¹³ Another study reported that highly secure individuals tended to be better adjusted than dismissive individuals after the tragedy, as assessed by self-reported PTSD symptoms.¹⁴ The authors further suggested that secure or attached individuals actually may be able to experience some type of personal growth or internal strength after the attacks. Moreover, in a study of 46 college students, positive emotions served to buffer against depression after the attacks.¹⁵

Factors That Influence Resilience

Several factors have been purported to influence the enhancement of resilience. In a phenomenological, qualitative study of adult female survivors of childhood sexual abuse, resilience determinants (specific innate and learned characteristics that contribute to participants’ ability to become resilient adults) and resilience processes (how participants in the study described becoming resilient) were assessed. Their results identified 5 resilience determinants:

being interpersonally skilled or having the ability to interact positively and effectively with others; being competent (eg, excelling in school or athletics); having high interpersonal self-worth or self-regard; being spiritual; and having what may be perceived as helpful life circumstances (eg, being the youngest in the family). Resilience processes were reportedly enhanced by coping strategies (eg, writing, praying, keeping busy, setting boundaries), refocusing and moving on, healing actively (ie, taking responsibility for one’s own recovery and refuting the “victim” role, often through counseling), and being able to integrate the trauma into their current life stories without excessive emotional discomfort, or active closure.¹⁶

Factors That Influence Resilience, Job Satisfaction, and Job Performance

Studies have begun to explore the construct of resilience on emotional responsiveness and its impact on job performance. In 1 study, the relation between human resources, also referred to as psychological capital (broadly theorized as a positive state of development and includes dimensions including hope, optimism, and resilience), and job performance was assessed in 3 factories located in the People’s Republic of China.¹⁷ Results indicate that psychological capital in the aggregate and hope, optimism, and resilience when considered separately correlated positively with performance (eg, a factory with performance outcome and relative merit-based salary).¹⁷ A later study confirmed these findings in that employees’ hope, optimism, and resilience, when assessed both separately and combined in the construct of psychological capital, had a positive impact on job performance, organizational commitment, and organizational citizenship behavior.¹⁸

The relation between positive emotionality, conceptualized as the presence of ambient positive emotions and the ability to express positive emotions during adversity, and measures of burnout, job satisfaction, perceived performance, and intention to leave one’s job in a sample of certified public accountants were analyzed. The results of the study supported a complementary relation between positive emotions and negative emotions such that positive emotions appear to support job satisfaction and performance, whereas negative emotions appear to predict burnout and intentions of leaving the job.¹⁹

The purpose of the present study was to expand upon these findings. In particular, the goal was to determine whether assessing and intervening at the cognitive-affective domain (stress arousal) would best foster resilience regarding burnout, job performance, and job outcome. More specifically, this study assessed whether burnout and job-related outcomes are predicted more by stress arousal (a cognitive-affective reaction) than by conditions associated with the job. Based on the recommendations of Rodgers²⁰ and practices by Smith et al²¹ and Everly et al,¹⁹ structural modeling is used to provide greater support for arguments supporting causality than have past correlation analyses.

METHODS

Subjects

Subjects were selected from a database of responses from 701 individuals who were sampled from a mailing list provided by the American Institute of Certified Public Accountants. The database contained responses to a demographic data sheet and a battery of psychometric instruments. This study incorporated the responses of the 491 individuals in the aforementioned sample used in public accounting. Of these subjects, 58% (283) were men, 79% (387) were married, 95% (457) were white, and 61% (299) indicated that they were between 26 and 45 years old. More than 64% (314) possessed a bachelor's degree and another 34% (166) held a masters degree.

Measures

The following 3 role stress measures were incorporated into this study:

1. Role ambiguity: 3 items from the 14-item Role Conflict and Role Ambiguity Scale²²
2. Role conflict: 3 items from the 14-item Role Conflict and Role Ambiguity Scale²²
3. Role overload: 5 items from the Beehr et al scale²³

Each of these measures has been identified as a significant workplace stressor.²¹ Fogarty et al discuss the acceptability of these measures in terms of their psychometric properties reported in prior research.²⁴ Each of these constructs is measured on a 5-point Likert-type scale. The key outcome measures were as follows:

1. Performance: a 6-item scale drawn from Dubinski and Mattson²⁵
2. Turnover intentions: 3 items drawn from Donnelly and Ivancevich²⁶
3. Job satisfaction: 27 items drawn from the Churchill et al scale²⁷
4. Burnout: 24 items drawn from the multidimensional role-specific version of the Maslach Burnout Inventory²⁸

Each of the outcome measures were measured using 5-point Likert-type scales.

Stress arousal was measured using 17 items from the stress arousal scale (SAS).²⁹ This instrument was designed to tap the respondent's cognitive-affective domain (precipitators of the physiological stress response), which allows an indirect measure of one's level of stress arousal. The conditions that define emotional arousal (as measured by SAS) have been shown to be highly correlated with stress-related physical symptoms.^{30,31}

The SAS has been used in a number of accounting research studies.^{21,32} Factor analysis on a large data set indicated that there were 2 underlying dimensions: psychological discord (13 items, $\alpha = .91$) and relaxation (4 items, $\alpha = .86$).³³ Psychological discord was defined as "the state of emotional distress experienced as a result of cognitive interpretation of environmental events" and relaxation was defined as "a state of cognitive-affective psychophysiological homeostasis, ie, the lack of extraordinary arousal."

These results have been replicated numerous times.^{21,32} Responses were made on 4-point Likert-type scales ranging from "seldom or never" (1) to "almost always" (4).

Analysis

A series of EQS structural modeling analyses (Multivariate Software, Encino, CA) were used to test the hypothesis that a putative causal model that included stress arousal, as measured by cognitive-affective indicia, would explain greater variance than a direct stressor to outcome effects model. The selection of this methodology was guided by the recommendation of Rodgers,²⁰ who cogently argued that traditional null hypothesis significance testing yields less valuable information than does structural modeling to researchers in the behavioral sciences. He argued that structural modeling has the advantages of forcing theoretical precision, promoting more useful data analyses, and being more readily translated into practical applications.

Although the stress arousal, burnout, and job satisfaction scales were multifactorial in nature, the role stressor, performance, and turnover intentions scales were unidimensional (ie, the items on each scale loaded on a single factor). To facilitate the ensuing measurement model tests, we combined the items for each of these scales onto 2 composite indicator variables using a procedure described by Bentler and Wu.³⁴ This procedure is suitable when there is no expectation that any of the composites created would be different from each another, and "each composite should measure the same construct, or combination of constructs, as measured by a single composite of all the original scores."³⁴ This procedure facilitated the development of a latent variable model by allowing for a better estimate of the random error associated with these constructs. Random error is taken into account when estimating paths from constructs to indicator variables and within the structural model.

We conducted a confirmatory factor analysis on the sample data to independently test the construct and discriminant validity among the constructs represented by the measures. Anderson and Gerbing prescribe assessment of the measurement model before testing the structural linkages.³⁵ The complete measurement model was tested using the elliptical estimation procedure in EQS version 6.1. Table 1 presents the items that comprised each latent variable to be tested along with the mean score and standard deviation for each predicted latent variable.

We then conducted a series of EQS structural modeling analyses to assess the impact of stress arousal. The first model examined only the direct effects from the role stressors to the outcome constructs. The second model inserted stress arousal as a mediator in the relations between the role stressors and the outcomes. Then, in each analysis, we dropped statistically nonsignificant parameters based on the output of Wald tests applied to each model.³⁶ We assessed model fit for

both the measurement and structural model tests using a variety of fit measures outlined by Bentler.³⁷ These measures include the goodness-of-fit chi square, the normed fit index, the non-normed fit index, the comparative fit index, the LISREL (Scientific Software International, Lincolnwood, IL) goodness-of-fit index, the average off-diagonal squared residual (AOSR), and the root mean square error of approximation (RMSEA). We assessed model fit using multiple measures because no single measure is definitive.²⁴

RESULTS

Tables 2 and 3 present the measurement model test results. Table 2 indicates that the path coefficients from each latent construct to its manifest indicator is significant at $P < .01$. The fit indices reported in Table 3 indicate good model fit because each is above the 0.900 minimum threshold. In addition, the AOSR of 0.031 and the RMSEA of 0.07 fall within their standard of acceptance.

Table 4 and Figure 1 present the results from testing the model, which examined the direct effects of the role stressors on the 4 key outcomes with stress arousal excluded from the analysis. The fit indices reported in Table 4 indicate a good model fit because each of their values is above the minimum threshold of 0.900. In addition, the AOSR value of 0.043 and the RMSEA of 0.075 fall within their respective standards for acceptance. As Figure 1 illustrates, role ambiguity has a significant positive influence on burnout (0.628) and turnover intentions (0.561) and has a significant negative influence on job satisfaction (-0.824) and performance (-0.251). Thus, role ambiguity appears to increase burnout and turnover intentions while decreasing job satisfaction and performance. Role overload has a significant positive influence on burnout (0.340) and turnover intentions (0.144). It does not affect job satisfaction or performance. Finally, role conflict did not have significant effects on any of the outcome constructs.

Table 5 and Figure 2 present the results from testing the model, which includes stress arousal as a posited mediator in the relations between sources of role stress and the 4 key outcomes. With the exception of the LISREL goodness-of-fit index, the fit indices reported in Table 5 indicate a good model fit because each of their values is above the minimum threshold of 0.900. In addition, the AOSR value of 0.034 and the RMSEA of 0.073 fall within their respective standards for acceptance. As Figure 2 illustrates, the resulting model is much more complex than the direct effects model. Role conflict now has a direct, positive influence on burnout (0.902) and an indirect effect through stress arousal. Role conflict also has an indirect negative influence on performance, through stress arousal. Role conflict also has a negative influence on job satisfaction (-1.436) and a positive influence on turnover intentions (1.712). Role ambiguity has a negative influence on performance (-0.178) and turnover intentions (-0.405). Although it decreases perfor-

mance, as in the direct effects model, role ambiguity now appears to reduce turnover intentions. Counterintuitively, role overload is negatively related to burnout (-0.340) and turnover intentions (-0.932) and is positively related to job satisfaction (0.900) and performance (0.248). Overall, role conflict plays a major part and role overload an enhanced part in explaining the outcomes. Role ambiguity appears to play a reduced role. In turn, stress arousal has a significant positive influence on burnout (0.329) and a negative influ-

TABLE 1

Factors for Measurement Model Tests

Latent Construct	No. Observed Indicators	Model Test Results*
Role conflict	2	= 2.874, $\sigma = .863$, $\alpha = .797$
Role ambiguity	2	= 2.539, $\sigma = .835$, $\alpha = .757$
Role overload	2	= 2.949, $\sigma = .934$, $\alpha = .886$
Stress arousal	2	= 2.274, $\sigma = .573$, $\alpha = .791$
Burnout	3	= 2.216, $\sigma = .663$, $\alpha = .743$
Job satisfaction	4	= 3.859, $\sigma = .696$, $\alpha = .753$
Performance	2	= 4.167, $\sigma = .624$, $\alpha = .813$
Turnover intentions	2	= 2.256, $\sigma = 1.275$, $\alpha = .979$

*Cronbach alpha reliability computed to index the internal consistency of the measure. Values exceeding .70 are considered satisfactory.

Source: Nunnally, J. C. (1978). *Psychometric theory* (2nd ed). New York: McGraw-Hill.

TABLE 2

Standardized Measurement Coefficients for the Construct Indicators

	Standardized Coefficient	t^*
Role stressors		
Role conflict, RC ₁	.722	—†
Role conflict, RC ₂	.908	14.468
Role ambiguity, RA ₁	.851	—†
Role ambiguity, RA ₂	.721	13.321
Role overload, RO ₁	.854	—†
Role overload, RO ₂	.930	20.449
Stress arousal		
Discord	.832	—†
Relaxation	.803	15.619
Burnout		
Depersonalization	.738	—†
Emotional exhaustion	.858	17.489
Reduced personal accomplishment	.568	11.816
Outcomes: Job satisfaction		
Recognition	.805	—†
Boss	.757	16.570
Perks	.755	13.568
Family	.286	5.903
Turnover intentions, TI ₁	.980	—†
Turnover intentions, TI ₂	.977	47.215
Performance, JP ₁	.847	—†
Performance, JP ₂	.784	8.476

*Each of the reported t values is significant at $P < .01$.

†Structural equations modeling procedures require that 1 measure of each construct be fixed to 1.0 to establish the scale of the latent construct.

TABLE 3

Results of Measurement Model Tests—Panel B: Goodness-of-Fit Summary†‡§

	Result	Standard for Acceptance
Statistical tests		
χ^2	430	NA
<i>df</i>	127	NA
<i>P</i>	.00	>.05
χ^2/df	3.39	<2.0
Fit indices		
NFI	.921	>.900
NNFI	.923	>.900
CFI	.960	>.900
GFI	.943	>.900
Residual analysis		
AOSR	.031	<.05
RMSEA	.070	<.10
95% confidence interval of RMSEA	.063-.077	NA

AOSR=average off-diagonal squared residual; lower values indicate better fit. CFI=comparative fit index; higher values indicate better fit. GFI=goodness-of-fit index; higher values indicate better fit. NFI=normed fit index; higher values indicate better fit. NNFI=non-normed fit index; higher values indicate better fit. RMSEA=root mean square error of approximation; lower values indicate better fit.

†The measurement model reflects the release of 3 factor covariances as determined by examination of the multivariate Wald test output from the test of the full model. The dropped covariances were satisfaction–performance, overload–performance, and conflict–performance. By dropping these covariances, the degrees of freedom increased from 124 for the full model to 127 for the reduced model.

§The Wald test is a post-hoc procedure that capitalizes on a particular sample (ie, it is not theory driven). Replication with another sample is needed to determine whether the relations reported herein hold.

TABLE 4

Direct Effects Model Goodness-of-Fit Test Results

	Result	Standard for Acceptance
Statistical tests		
χ^2	412	NA
<i>df</i>	110	NA
<i>P</i>	.00	>.05
χ^2/df	3.75	<3.0
Fit indices		
NFI	.942	>.90
NNFI	.946	>.90
CFI	.956	>.90
GFI	.900	>.900
Residual analysis		
AOSR	.043	<.05
RMSEA	.075	<.08
90% confidence interval of RMSEA	.067-.083	

The final direct effects model reflects the release of nonsignificant parameter estimates as determined by examination of the multivariate Wald test output from the test of the model containing the initial hypothesized paths from each stressor to each outcome. AOSR=average off-diagonal squared residual; lower values indicate better fit. CFI=comparative fit index; higher values indicate better fit. GFI=goodness-of-fit index; higher values indicate better fit. NFI=normed fit index; higher values indicate better fit. NNFI=non-normed fit index; higher values indicate better fit. RMSEA=root mean square error of approximation; lower values indicate better fit.

ence on performance (−0.345). Some changes in the direction or sign of the paths also are seen.

With the exception of job satisfaction, the stress arousal model explains a larger increase in the variance for each of the outcomes than does the direct effects model (see Table 6).

The r^2 for burnout increased from 0.69 to 0.76 (10%). The r^2 for performance increased from 0.06 to 0.14 (133%). The r^2 for turnover intentions increased from 0.40 to 0.59 (47.5%). There was no change for job satisfaction ($r^2=0.67$). Thus, inclusion of stress arousal as a mediator increased the explanatory effects of role stressors on the job-related outcomes.

The emotional arousal captured by the stress arousal construct clearly is important to capturing the effects of role conflict. This becomes even clearer when looking at the total effects, which include the direct effect plus the product of the indirect effects through stress arousal. For role conflict to burnout, the total effects equal $0.90 + (0.67 \times 0.33) = 1.12$. Nineteen percent of the impact of role conflict on burnout is the result of the indirect effect. Role conflict has an indirect effect only on performance, through stress arousal. In this case the total effects equal $0 + (0.67 \times -0.34) = -0.23$. One hundred percent of role conflict’s impact on performance is a mediated effect through stress arousal.

DISCUSSION

The potential influence of the role stressors examined in this study has been of considerable interest to accounting researchers through the years. As noted above, some have theorized that these are consequences of other environmental influences; however, another stream of research positions them as independent (ie, exogenous) predictors of stress and its consequences. Regardless, their influence as stress antecedents is well documented.

Previous research reports role conflict as having significant positive relations with stress arousal²¹ and job tension,^{38,39} burnout,^{21,24,40} and turnover intentions.⁴¹ Conversely, role conflict was found to have a negative relation to job satisfaction^{21,32,38} and performance.³⁹ The present study supports these findings, but with a caveat. The relations among role conflict and burnout, turnover intentions, job satisfaction, and performance occur only when stress arousal is introduced as a mediator between the stressor and the outcomes. These results support the argument that stress arousing the cognitive-affective/emotional domain produces negative psychological and behavioral responses.^{30,31} The findings of this study go even further by demonstrating clearly that without the cognitive-affective response, role conflict has no effect on any of the outcomes.

The results for role ambiguity are not as clear. When examining the direct effects model, the results are consistent with previous research, with role ambiguity having positive relations with burnout^{21,24} and turnover intentions.⁴¹ Role ambiguity is also negatively related to job satisfaction³⁸ and performance.⁴¹

When examining the mediator model, which includes stress arousal, the impact or involvement of role ambiguity changes considerably. Previous research shows role ambiguity having a significant positive relation to stress arousal in studies in which ambiguity was measured using items loading from a factor analysis of Kahn et al⁴² and Rizzo et al²² scales.^{33,34} The results from the present study do not show this relation. One possible explanation lies with the measures used. The findings of the present study are consistent with those of Smith et al,²¹ which also failed to find a significant relation between role ambiguity and stress arousal. Like us, they also used only Rizzo and colleagues²² items to measure the construct. The measures of Kahn et al were not used in either study. Role ambiguity also failed to show a significant relation with burnout and job satisfaction. Again, this may be the result of using different measures. It is possible that the measures of Kahn et al⁴² included some aspect(s) of role ambiguity not addressed by Rizzo et al.²² This needs to be examined further.

As in the direct effects model, role ambiguity retained a significant negative relation with performance in the mediator model. Unlike the direct effects results, however, role ambiguity is negatively related to turnover intentions in the mediator model. The positive relation in the direct effects model is as one would intuitively expect.⁴¹ The findings in the mediator model are consistent with those of Smith et al,³³ who reported a negative relation with turnover intentions. They provided 2 possible explanations for this counterintuitive finding: role ambiguity enhances an individual's insecurity,⁴³ which in turn attenuates one's inclination to consider a job change, and individuals experiencing high role ambiguity do not perceive that alternative job opportunities offer lower levels of ambiguity. These do not explain why the sign of the path changed between the direct effects model and the mediator model.

The change in the sign and the loss of 2 significant paths suggests the inclusion of stress arousal. Although not directly related to role ambiguity, stress arousal does have an impact on how this stressor relates to outcomes. These findings can be explained by what is referred to as specification error in structural modeling.⁴⁴ A construct that is a relevant cause (ie, moderately to highly correlated with other causes) that is not included in the model will lead to biased solutions. These biases may result in the wrong sign on paths to endogenous (outcome) variables and/or paths being deemed significant that are not and vice versa.⁴⁴ As we can see from the results of role conflict and stress arousal, stress arousal is strongly related to role conflict. Thus, leaving stress arousal out of the direct effects model was a major specification error of the model. By including it in the

model, the contribution of role ambiguity is better explained, as is that of role conflict.

We find similar problems when looking at the effects of role overload. In the direct effects model, role overload is positively related to turnover intentions and burnout. Previous research has also reported positive relations between role over-

FIGURE 1

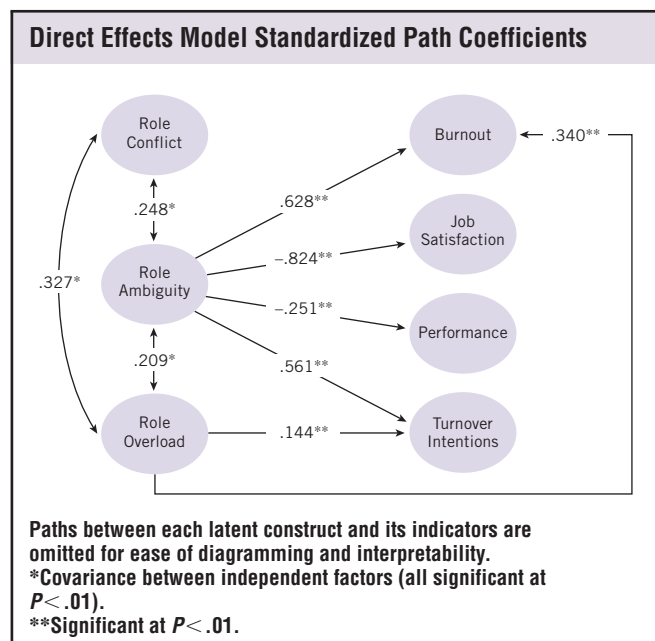


TABLE 5

Stress Arousal Model Goodness-of-Fit Test Results		
	Result	Standard for Acceptance
Statistical tests		
χ^2	493	NA
df	137	NA
P	.00	>.05
χ^2/df	3.60	<3.0
Fit indices		
NFI	.945	>.90
NNFI	.949	>.90
CFI	.959	>.90
GFI	.891	>.90
Residual analysis		
AOSR	.034	<.05
RMSEA	.073	<.08
90% confidence interval of RMSEA	.066-.080	

The final direct effects model reflects the release of nonsignificant parameter estimates as determined by examination of the multivariate Wald test output from the test of the model containing the initial hypothesized paths from each stressor to each outcome. AOSR=average off-diagonal squared residual; lower values indicate better fit. CFI=comparative fit index; higher values indicate better fit. GFI=goodness-of-fit index; higher values indicate better fit. NFI=normed fit index; higher values indicate better fit. NNFI=non-normed fit index; higher values indicate better fit. RMSEA=root mean square error of approximation; lower values indicate better fit.

FIGURE 2

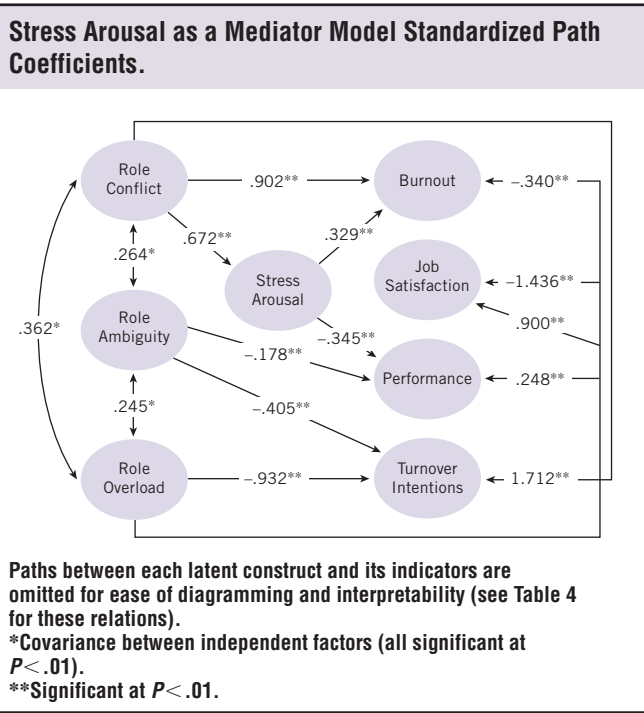


TABLE 6

Comparison of Variance Explained for Each Key Outcome

Outcome	Direct Effects Model r^2	Stress Arousal Model r^2
Burnout	.69	.76
Job satisfaction	.67	.67
Performance	.06	.14
Turnover intentions	.40	.59

load and these 2 constructs.^{21,24,40} Unlike previous studies, role overload was not related to job satisfaction or performance. In the mediator model, role overload is positively related to job satisfaction and performance and negatively related to burnout and turnover intentions.

Both Fogarty et al²⁴ and Smith et al²¹ found significant positive relations between role overload and both job satisfaction and performance. In explaining these counterintuitive findings, Fogarty et al²⁴ proposed that overload includes an “eustress” component that is unmediated, and Smith et al²¹ speculated that these relations may have resulted from individuals evaluating overload as a challenge rather than a threat, thus giving it the potential to promote personal gain and growth.⁴⁵ Similar to this study, Smith et al²¹ included stress arousal as a predictor of job satisfaction and performance.

From a health perspective, role overload has been found to have a significant, positive direct relation to stress arousal.^{21,33,34} That is not the case in the present study; role overload is not related to stress arousal. Moreover, Fogarty et al²⁴ found that overload had

a significant positive relation to burnout, as did Sweeney and Summers⁴⁰ during their January through April “busy season” analyses. Although Smith and colleagues²¹ initial replication of the Fogarty et al model²⁴ also measured a significant positive direct relation between overload and burnout, this relation was no longer significant when stress arousal was added to the model as an antecedent to burnout, leading to the proposition that a direct path between the former 2 constructs may not be warranted. That conclusion appears a bit premature because this study shows a significant, negative relation between role overload and burnout with stress arousal included in the model. It is also negatively related to turnover intentions. These results are consistent with the positive relations with job satisfaction and performance. Thus, role overload may be seen as a positive challenge, as argued above. Alternatively, in today’s economic conditions, role overload may be interpreted as job security, relieving another potential stressor.

Again, the change in the nature of the relation for role overload suggests serious model specifications problems with the direct effects model. Stress arousal plays a critical role in explaining the relations between the 3 stressors and the 4 outcome constructs examined in the present study.

CONCLUSIONS

This study used latent variable structural modeling to segregate the direct effects of adverse conditions vs the cognitive-affective mediating effects of those conditions upon selected job-related outcome within a resilience context. Our data showed that cognitive-affective mediation accounted for a 130% increase in explained variation in job performance, a 48% increase in variation in job turnover intention, and a 10% increase in burnout.

Our intention in conducting such an investigation was to attempt to identify a practical defining aspect of human resilience in the face of adverse conditions, with the subsequent intention of providing better guidance for the design and implementation of programs designed to enhance human resilience. The military, medicine, nursing, emergency services, and public health professions seem like professions that could prosper from enhanced resilience given their unusual exposure to adverse conditions. It may be that these data could serve to improve training programs for these “at risk” professional groups. The implications may be far broader in scope, however. Could these data assist in enhanced public health preparedness programs for the public? This seems to be a question worthy of additional investigation.

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