

Strain in Teaching and Research: Structural Equation Modeling Approach

MOHD KAMEL IDRIS*

Universiti Putra Malaysia

ABSTRACT

A transactional model of stress is expanded to incorporate role stressors (i.e. role overload, role ambiguity and role conflict) as the antecedents of strain and the outcomes of strain including cynicism, professional efficacy, and organizational commitment. This integrated model clarifies the impact of role stressors on strain and the impact of strain on cynicism, professional efficacy and organizational commitment on a study among academics in Malaysian public universities. The perceived organizational support, peer support, and self-efficacy are added in consideration of research indicating that those variables can buffer the effect of role stressors on strain. A longitudinal survey with a six month time interval yielded 357 respondents for Time1 and 210 respondents for Time 2. A structural equation modeling (SEM) approach was used to test this model using data at Time 1 with a cross-validation on the sample at Time 2. The result of the study indicated that role ambiguity account for the strongest direct effect on strain; strain had the strongest direct effect on cynicism. The path analysis revealed that the paths of role ambiguity, strain, cynicism, organizational commitment and turnover intention was a critical path of the model.

Keywords: Strain, stress, academic, structural equation modeling

INTRODUCTION

Recent global research on stress among academics indicates that the phenomenon of occupational stress in universities is widespread and increasing (Winefield, 2000). Work-related stress is of growing concern because it has significant implications for universities through academics' dissatisfaction, lowered productivity and lowered emotional and physical health (Dua, 1994). Stressed

* Corresponding author: Email: mkamel@econ.upm.edu.my

Any remaining errors or omissions rest solely with the author(s) of this paper.

academics are a cost to a university in terms of absenteeism, tardiness and turnover. A higher level of stress among academics may affect the quality of graduates, research and publications.

It is generally believed that an optimum level of pressure on individuals at work will result in higher productivity (Dollard, Winefield, Winefield & de Jonge, 2000). The Yerkes-Dodson law implies that a certain level of stimulation improves performance (Powell, 2000). However, academics may now be experiencing demand levels that are not readily manageable, which may lead to stress. This is evidenced by a line of research that linked stress among academics to resource constraints (Dua, 1994; Taris *et al.*, 2001; Gilliespie *et al.*, 2001), showing that academics who experience shortages of research funding or lack of research facilities run the risk of becoming exhausted and alienated from their work lives.

Based on the above problems, this paper aims at: a) to test the theoretical model of academic stress using structural equation modeling in order to strengthen the causality between the variables in the hypothesized model; and b) to cross-validate the result of time 1 using data for time 2 to determine the replicability of the theoretical model.

LITERATURE REVIEW

Role stressor

Lazarus and Folkman (1984) defined a stressor as an element in the environment that is appraised by the individual as threatening their well-being. Their transactional model posits personal and situational factors as important in explaining the effect of stressors (Lazarus, 1999). Situational factors that may hinder the individual's task performance in an organization might be their surrounding environment and poor job design. These elements then limit an individual's role performance at the workplace. Since the focus of this study is on the occupational stress of academics in a university setting, a role stressor can be defined as the pressure experienced by an individual as a result of organizational and job-specific factors in the form of demands and constraints that have been placed on them (Kahn, Wolfe, Quinn, & Snoek, 1964). Role stress theory states that organizational factors generate role expectations among role senders, who then transmit these as role pressures to the person. Experienced and prolonged pressure can create symptoms of ill health (Kahn *et al.*, 1964).

The literature has established the relationships between role stressors and the feeling of strain (Lee & Ashforth, 1996; Fogarty, Singh, Rhoads, & Moore, 2000; Peiro, Gonzalez-Roma, Tordera & Manas, 2001; Posig & Kickul, 2003). According to Posig and Kickul (2003), strain occurs mainly because of fatigue that results from pressure to comply with the set of demands. Researchers agree

that role stressors are made up of three separate but related constructs: role overload, role ambiguity and role conflict (Kahn, 1980; Schaubroeck, Cotton & Jennings, 1989; Kelloway & Barling, 1990; Peiro *et al.*, 2001). Role overload exists when role expectations are greater than the individual's abilities and motivation to perform a task (Schaubroeck, Cotton & Jennings, 1989; Spector & Jex, 1998; Conley & Woosley, 2000). Role ambiguity arises when individuals do not have clear authority or knowledge about how to perform the assigned jobs (Rizzo, House & Lirtzman, 1970; Ivancevich & Matteson, 1980; Ashforth & Lee, 1990). Role conflict refers to incompatibility of expectations and demands associated with the role (Rizzo *et al.*, 1970; Ivancevich & Matteson, 1980; Ashforth & Lee, 1990).

Role overload creates strain because of the pressure to do more work, having a heavy workload that interferes with work quality, and the feeling of not being able to finish a given task within a specified period of time (Conley & Woosley, 2000). The workload by itself is not harmful but rather the perception of threats related to the workload causes strain (Smith & Lazarus, 1990). In the case of role ambiguity, individuals experience strain when they consistently do not have a clear picture about their work objectives, their co-workers' and supervisor's expectations of them, and the scope and responsibilities of their jobs (Ivancevich & Matteson, 1980). Role ambiguity may also be due to the complexity of the job, that is, the job contains many tasks. Role conflict occurs when individuals experience conflict between their capabilities and the defined role behaviour or have competing demands on their time and energy (Rizzo *et al.*, 1970). In summary, it can be concluded that generally role stressors are associated with strain. Role overload, role ambiguity and role conflict threaten an individual's capability to accomplish assigned tasks. Task accomplishment will bring wellness, whereas failures will lead to the feeling of strain.

Strain

Lee and Ashforth (1996) defined strain as affective, feeling states of the individual characterized by depleted emotional resources and lack of energy. There are many ways to explain the feeling of strain. Lazarus' transactional theory uses the concept of strain to explain the pain which is experienced by individuals when environmental factors are perceived as overtaxing and exceeding their ability to cope with them (Lazarus & Folkman, 1984). In battles to fight strain, individuals adjust or manage their cognitions, emotions and behaviour to adapt to the perceived stressors. When there is a failure to handle these stressors, strain will occur.

Strain is associated with various psychological and physiological reactions. Psychological strain refers to a particular form of emotional distress arising in response to a situation involving perceived threat to a person's well-being.

Transactional models of stress emphasize the perceptual nature of stress-induced emotions (Cox, 1978; Folkman & Lazarus, 1988). Emotion can take positive and negative forms. Examples of positive emotions are happiness, pride, relief and love. Negative emotions include anger, fright, anxiety, shame, guilt, sadness, envy, jealousy and disgust (Smith & Lazarus, 1993). Strain may also be manifested in terms of physiological or somatic disturbance. Somatic disturbances include stomach complaints, ill health, sleep disorders, complaints, and low back pain. In more serious manifestations, work-related stressors are associated with hypertension and cardiovascular disease (CVD) (Landsbergis *et al.*, 2001).

Outcomes of strain

The researcher reviewed four outcomes of strain: cynicism, professional efficacy, organizational commitment, and intention to leave. Numerous studies have looked at these four aspects of stress as outcomes of the feeling of strain (Schaufeli, Leiter, Maslach, & Jackson, 1996). The first outcome of strain is cynicism. Schaufeli *et al.* (1996) defined cynicism towards work as a feeling of indifference or a distant attitude towards one's work in general. A prolonged exposure to certain stressors will result in strain. Subsequently, individuals may develop cynicism as a response to strain. Over time, these individuals may generalize this negative feeling toward all individuals around them, their jobs and their organization. Highly cynical people tend to avoid voluntary involvement in interpersonal relationships and organizational activities. Cynicism is considered a dysfunctional mode of coping with the feeling of strain in which individuals distance themselves emotionally from work (Lee & Ashforth, 1993). As a result of prolonged and severe strain, workers develop emotional callousness and become cynical toward work, peers, clients, and the organization as a whole (Cordes & Dougherty, 1993). This reaction may lead to lower performance and other negative consequences, such as lack of commitment and turnover intention.

The second outcome of strain is reduced professional efficacy. Professional efficacy refers to employees' expectations of continued effectiveness at work (Schaufeli *et al.*, 1996). An individual with low professional efficacy does not have a positive opinion of their work performance (Evers & Tomic, 2003). It has been found that people suffering from burnout appeared to be less effective in their daily work, and work performance suffers because of negative work attitudes and behavior (Schaufeli, Maslach, & Marek, 1993). The negative opinion about past performance can influence their continuing effort and then reduce productivity and performance. Given the fact that individual reward is based on their performance, it is crucial to investigate the professional efficacy through occupational stress studies. Theoretically, individuals who have the feeling of reduced professional efficacy may perceive that all effort repeatedly fails to produce positive results, so they plan to leave the job (Maslach, 1982).

However, previous studies have shown that the intention to leave was not related to actual turnover (e.g. Seigall & McDonald, 2004; Somers & Birnbaum, 2000). This is bad for organizations if employees who lack confidence in themselves are still holding their jobs.

The third outcome is diminished organizational commitment. Organizational commitment is defined as the relative strength of an individual's identification with, and involvement in, a particular organization (Mowday, Steers, & Porter, 1979). There is rich empirical evidence showing relationships between affective organizational commitment and intention to leave (Mor Barak *et al.*, 2001; Rhoades *et al.*, 2001; Wasti, 2003). Affective commitment describes an individual's emotional state toward their organization, whereas intention to leave represents individual's decision to leave his or her organization. Moreover, affectively committed employees are more likely to be motivated because they are involved with organizational activities. However, constant exposure to strain may alienate these employees from organizational activities. Over time they may distance and separate themselves from their job and organization. The feeling of detachment has been found to predict intention to leave and actual turnover (Mathieu & Zajac, 1990; Mowday *et al.*, 1982; Rhoades & Eisenberger, 2002).

The final outcome is intention to leave. The term 'intention to leave' refers to the situation in which an individual is consciously making a decision whether to leave an organization (Weisberg, 1994). Since excessive employee turnover rate is detrimental for organizations, an alternative estimate to future turnover may be derived from employees' intention to leave. However, results from studies of the relationships between intention to leave and actual turnover have been mixed. Parasuraman (1982) found a positive significant relationship, while Seigall and McDonald (2004) did not. Somers and Birnbaum (2000) suggested that the strong labor market at the time of the study was identified as a factor that deterred professional hospital employees from leaving their organization. Whatever it is, intention to leave is costly to the organization, as the stayers may divert their resources for their personal gain (Seigall & McDonald, 2004).

Literature also indicates that intention to leave is a negative outcome of job stressors (Janssen, De Jonge & Bakker, 1999). However the relationship between job stressors and intention to leave has been found to be indirectly related (Igbaria & Greenhaus, 1992; Koeske & Koeske, 1993). Since the relationship between strain and intention to leave is rather indirect, this study investigated the effect of strain on intention to leave through mediator variables (i.e. cynicism, professional efficacy and organizational commitment).

MODEL OF THE STUDY

As noted earlier, the aim of the study is to test the integrated model of the study. The proposed model was depicted in Figure 1.

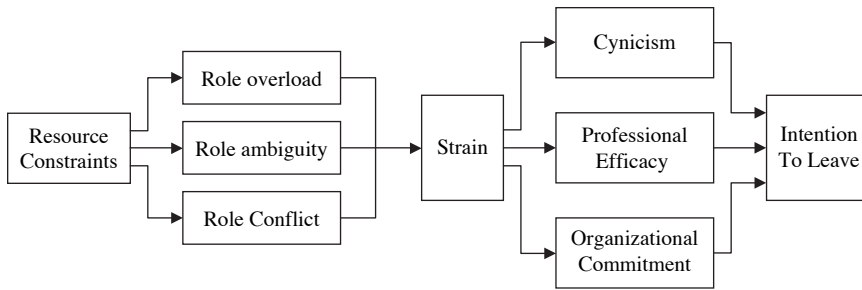


Figure 1 Hypothesized Model of the Study

The interconnecting paths in Figure 1 show that role stressors (role overload, role ambiguity, and role conflict) have a direct influence on strain, and in turn, strain has a direct influence on various outcomes (cynicism, professional efficacy, and organizational commitment). The outcomes of strain then have direct influence on intention to leave. Thus the focal point in this hypothesized model is that strain serves as a key mediating variable linking role stressors and outcomes of strain. Based on the proposed model, the researcher hypothesized that role stressors (i.e. role overload, role ambiguity, and role conflict), in combination, would influence strain and strain in turn would lead to intention to leave through the outcome variables (i.e. cynicism, professional efficacy, and organizational commitment).

METHODOLOGY

Data and respondent

Academics from five big public teaching and research universities in Malaysia were invited to participate in this study. A questionnaire with a stamped, addressed envelope was sent out to 2000 academics. The questionnaire contained seventy-five items that measured the variables based on the model of the study. The first stage of data collection started in January 2005. A coded questionnaire helped me to resend the questionnaires to respondents at Time 2. The second wave of data collection was carried out in July 2005 after a six-month lag time. A total of 357 out of 2000 academics returned the questionnaires at Time 1 for a response rate of 17%. At Time 2, 210 respondents returned questionnaires for a 59% response rate. The overall response rate was 10.5%.

Measures

Based on its popularity and wide use (Bowling, 1997), Goldberg's (1978) twelve-item General Health Questionnaire (GHQ12) was selected to measure the feeling

of strain (sample item: “Been able to concentrate on what you are doing?”). This measure is a screening instrument covering a range of psychiatric symptoms: somatic, anxiety, depression, self-esteem, stress, negative affectivity and social dysfunction (Tait, French & Hulse, 2003). The respondents were asked to rate the frequency with which they had experienced each situation on six-point scale (1 = Never, 6 = All the time). The internal reliabilities of this scale were .83 at Time 1 and .82 at Time 2. I used Spector and Jex’s (1998) Quantitative Workload Inventory (QWI) to measure role overload among academics (“How often does your job require you to work very fast?”). The five-item QWI represents the elements of quantity of work, amount of workload and time pressure. This scale had internal reliabilities of .88 at Time 1 and .87 at Time 2. I used Rizzo, House, and Lirtzman’s (1970) six-item scale to measure role ambiguity. The scale measured the level of academics’ perceived ambiguity about their role’s authority and responsibility, their work objective, necessary information about the job, and the expectation of others of them (“My job has clear, planned goals and objectives”). I reverse coded all the items of this measure so that they would reflect ambiguity. This scale had internal reliabilities of .85 at Time 1 and .84 at Time 2. Role conflict was measured by Rizzo *et al.*’s (1970) eight-item scale (“I work with two or more groups who operate quite differently”). The scale was intended to measure the perception of resource adequacy, conflicting requests, group interdependence and different working styles experienced by academics. The internal consistencies for the scale were .88 at Time 1 and .84 at Time 2.

I used a four-item scale of cynicism from the Maslach Burnout Indicator-General Survey (MBI-GS) (Schaufeli *et al.*, 1996) to measure cynical attitudes toward work, colleagues and students. The original cynicism scale of MBI-GS consists of five items. Taris *et al.* (2001) omitted item 3 (I just want to do my work and not be bothered) which did not perform well in their CFA and those reported by others (Bakker *et al.* 2003; Schutte, Toppinen, Kalimo & Schaufeli, 2000; Schaufeli, Salanova, González-romá & Bakker, 2002; Demerouti, Bakker, Vardakou, & Kantas, 2003). Sample items is: “I have become less enthusiastic about my work”. The Cronbach alphas for these items at Time 1 and Time 2 were both .89. A six-item subscale of the MBI-GS measured professional efficacy (Schaufeli *et al.*, 1996). Respondents were asked to rate the level of their current performance at work. Sample item is: “I have effectively solved most of the problems that arise in my work”. This scale had an internal reliability of .87 at both times. Allen and Meyer’s (1996) affective organizational commitment scale was used to measure academics’ emotional attachment to their universities. Sample item is: “I do not feel a strong sense of belonging to this university”. The internal reliabilities of the scale in the present research were .85 at Time 1 and .80 at Time 2.

I used O’Driscoll and Beehr’s (1994) 3-item scale to measure intentions to leave. The respondents were asked whether they thought about leaving their job,

planned to look for a new job over the next twelve months or would actively search for a new job outside the university. Sample item is: "Over the past 12 months, I have thought about quitting my present job". The internal reliabilities of the scale were .88 at both times.

Analyses

Structural equation modeling was used to test the proposed relationship between role stressors, strain and outcome of strain. The researcher used SEM approach to test the proposed model because of the complex structure of the model. SEM is useful in testing theories that contain multiple equation involving dependence relationship (Hair *et al.*, 2006). SEM can model all regression equation simultaneously. For example, in the proposed model, strain that was hypothesized as a criterion variable of role stressor becomes predictor variable to outcome variables in the subsequent dependence relationship. Given multiple advantages of SEM over least square regression, the researcher used SEM to test the overall model of this study. Among the most important advantage is the range of fit statistics provided by SEM such as chi-square, RMSEA and CFI to compare the models under study (Boomsma, 2000).

The study used 2-wave panel data of time 1 $N = 310$ and data for time 2 with a six month lag time was $N = 194$. The study tested the proposed model on the basis on latent structure. Latent variables are constructs that are measured by their respective indicators. The study used population mean along with covariance as moment matrices to be analysed by structural equation program. The study used maximum likelihood as a method of estimation. The study used AMOS program version 5.0 (Arbuckle, 2004) to estimate path coefficient of the relationship between the variables in the model. In order to assess the model fit, the researcher looked at the overall chi-square value, RMSEA, GFI and CFI together with its degree of freedom and probability value. The confirmatory type of analysis started with the hypothesized model. When the hypothesized model appeared poor fit to the data, the analysis proceeded for specification search in an exploratory mode. Exploratory mode means that the researcher respecifies the model based on the theories and modification indices.

RESULTS

Confirmatory factor analyses

All the confirmatory factor analyses were performed using AMOS 5.0. I examined the overall acceptability of the measures using the Chi-square statistic and Chi-square/d.f. and three fit indices: RMSEA (root mean square error of approximation), CFI (comparative fit index) and GFI (goodness of fit index)

(Browne & Cudeck, 1993; Hu & Bentler, 1995). A measurement model provides an acceptable fit when RMSEA is below .08 and GFI and CFI are more than .9 (Hair *et al.*, 1998). RMSEA and CFI were used because these fit indices are less sensitive to sample size when compared to other fit indices (Fan, Thomson, & Wang, 1999). Jöreskog and Sörbom (1984) proposed the GFI as an index of fit of models fit for data using maximum likelihood or ordinary least square estimation. All variables showed a good fit for one-dimensional constructs including the GHQ12 to measure strain, which was considered the key mediating variable in this study.

Structural equation modeling

The model produced a statistically significant chi-square value of 120.555 ($d.f = 13, p < 0.001$), $CMIN/d.f = 9.267$, $GFI = .922$, $CFI = .855$ and $RMSEA = 0.164$, which indicated a poor fit to the data. It is therefore apparent that some modification was needed in order to determine a model that better represented the data. Even though there was too large a discrepancy between the theoretical and the observed relations, at this stage it was useful to examine the main effects of role stressor on strain and strain on cynicism, professional efficacy and organizational commitment as the study expected such relationships. Role ambiguity was a strongest predictor to strain ($\beta = .391, t = 7.590$) followed by role conflict ($\beta = .170, t = 2.407$) and role overload ($\beta = .123, t = 3.189$). Strain was positive and significantly correlated with cynicism ($\beta = .541, t = 11.295$), negative and significantly correlated with professional efficacy ($\beta = .355, t = 10.260$) and organizational commitment ($\beta = .422, t = 6.666$).

Given the rejection of the hypothesized model, the researcher respecified the model to achieve the optimised model. At this step and all the subsequent analyses, the models were re-specified based on theoretical ground and modification indices. Therefore, I respecified the model until I obtained a good-fitting model. Four different paths were added sequentially to the originally hypothesized

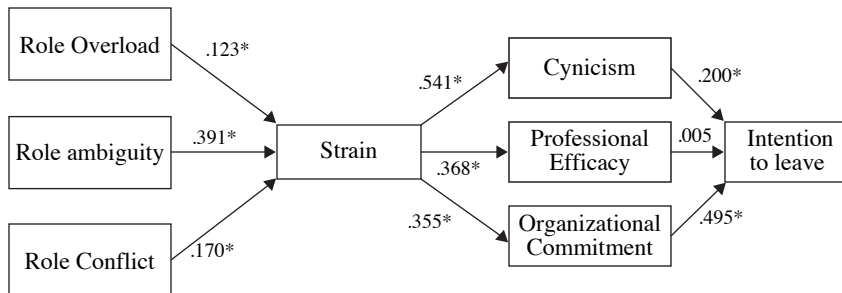
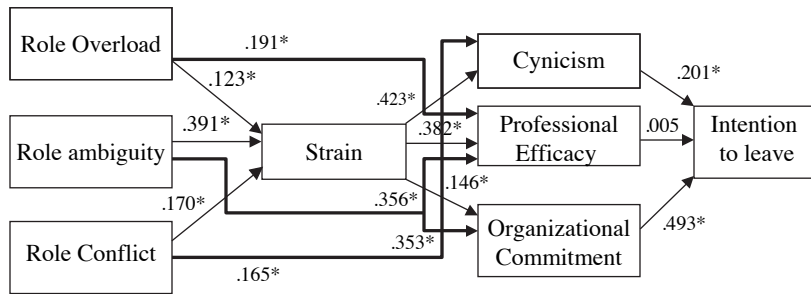


Figure 2 Results of the hypothesized model with data at Time 1.



Note: Added paths are in bold

Figure 3 Respecified model with data at Time 1.

model. The paths were role overload to professional efficacy (Golambiewski *et al.*, 1986; Leiter, 1993), role ambiguity to professional efficacy (Peiro *et al.*, 2001; Schwab & Iwanicki, 1982), role ambiguity to organizational commitment (Agarwal & Ramaswami, 1993; Jackson & Schuler, 1985; Mathieu & Zajac, 1990), and role conflict to cynicism (Peiro *et al.*, 2001; Schwab & Iwanicki, 1982). The final results are presented in Figure 3. A good-fitting model was achieved after four iterations. The respecified model produced a chi-square value of 25.264, $df=8$, $CMIN/df=3.158$, GFI was 0.981, CFI = 0.977, and RMSEA = 0.084, which indicate an acceptable fit to the data.

Replication or cross validation is needed (Cudeck & Browne, 1983) to examine whether the relationships between variables in the respecified model were consistent across time. Therefore I replicated the model obtained at Time 1 with the data at Time 2. The results are presented in Figure 4.

The replicated model produced a chi-square value of 17.801, $df=8$, $CMIN/df=2.225$, GFI = 0.978, CFI = 0.967 and RMSEA = 0.08, which also revealed a good fit for the data at Time 2. This indicates that the relationships between variables in the model were consistent across time. As noted above, the new

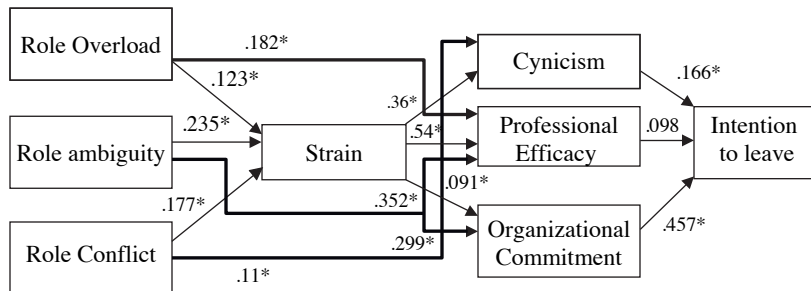


Figure 4 Respecified model replicated with data at Time 2.

Table 1 Standardized estimates for original and respecified models

Paths	Model/Standardized Estimate		
	Original	Respecified (Time 1)	Respecified (Time 2)
Role Overload → Strain	.123*	.123*	.123*
Role Ambiguity → Strain	.391*	.391*	.235*
Role Conflict → Strain	.170*	.170*	.177*
Strain → Professional Efficacy	.368*	.382*	.540*
Strain → Organizational commitment	.355*	.146*	.091*
Strain → Cynicism	.541*	.423*	.360*
Cynicism → Intent to leave	.200*	.201*	.166*
Professional Efficacy → Intention to leave	.005	.005	.098
Organizational Commitment → Intention to leave	.495*	.493*	.457*
Role Overload → Professional efficacy		.191*	.182*
Role Ambiguity → Professional Efficacy		.356*	.352*
Role Ambiguity → Organizational Commitment		.353*	.299*
Role Conflict → Cynicism		.156*	.110*

Note: Added paths are in bold

paths added to the original model were role overload → professional efficacy, role ambiguity → professional efficacy, role ambiguity → organizational commitment, and role conflict → cynicism. Table 1 presents standardized estimates for the hypothesized and respecified models with the data at Time 1 and at Time 2. The new paths and the coefficients are in bold.

Rather the result in Table 1 shows that it is quite plausible that the academic stress model accounts for the stress experienced by academics in Malaysian public universities was replicable and that the differences in factor loading and regression weight across six time did not present systematic and meaningful variation.

DISCUSSION

The test of overall model has provided evidence of stress as a process in which role stressors would lead to strain and in turn strain would lead to cynicism, professional efficacy and organizational commitment before leading to intention to leave. The null hypotheses were addressing the following questions a) the direct effects of role stressors on strain and then b) the subsequent direct effect of strain on cynicism, professional efficacy, and organizational commitment. Alternatively the researcher's overarching hypotheses guided the researcher to search for optimized model assuming that role stressors would also have direct effects on the outcome of strain.

In brief, an examination of the results of the alternative models reveals broad support on role stressors that have direct effects on the outcomes of strain. The alternative models that added the direct paths from role stressors to the outcomes of strain produced a better fit to the data than the proposed model. The different nature of overarching effects of role stressors on outcomes of strain also provided some light of opposition to the Kahn *et al.*'s (1964) role stress theory which assert that role overload, role ambiguity and role conflict as separate but correlated role stressors. The distinctiveness of the role stressors is evidenced by the different nature of their effects on the outcomes of strain. Moreover, the optimized model confirmed the mediational role of cynicism, professional efficacy and organizational commitment to the relationship between strain and intention to leave.

The analyses rendered the findings that warrant some discussion. First, the strong relationships between role stressors and strain indicate that role stressors were important determinants of strain. Thus, this study has advanced the notion that the feeling strain capture the cumulative effect of multiple role stressors. Understanding multiple stressors is particularly important when their combined effect could not be predicted based on evidence from single stressor studies. These role stressors might have synergistic effect when their combined effect is larger than predicted from the sizes of the response to each stressor alone. However, these results might not be definitive because factors that were not examined in this study such as work-family conflicts, organizational politics and health problems have appeared to affect the strain in previous studies.

Second, the overarching effects of role stress on the outcome of strain provided support for the conceptualization of cynicism, professional efficacy and organizational commitment as dysfunctional coping responses that resulted from the pressure of role stressors. In other words, role stressors that should have positive influences on individual performance were having negative influences in terms of default coping (Lee & Ashforth, 1993). Consequently, this overarching effect model of stress offers an alternative model of stress process in which certain role stressors might have direct effects on cynicism, professional efficacy, and organizational commitment. However, the stronger association between role stressors and strain as compared to the association between role stressors and outcomes of strain has left the proposed sequence of role stressors, strain and outcome of strain were more applicable with the data.

In the further investigation, the optimized model shows that strain was a more important determinant for cynicism and professional efficacy as compared to role overload and role ambiguity. For example in Table 5.21, the estimated standardized coefficient of strain predicting cynicism was 0.423 as compared to direct effect of role ambiguity to cynicism with estimated standardized coefficient of 0.258. These findings indicate that strain occurs first as a result of the influence of role stressors. This is consistent with Leiter's (1989) study that suggested

that strained individuals tend to show cynicism, which in turn undermines their professional efficacy. However, the direct effects of role ambiguity and role conflict on organizational commitment were stronger than the direct effect of strain on organizational commitment. In other words, role ambiguity and role conflict appeared to be more important determinants for organizational commitment than the strain. For example, in Table 5.21, the estimated standardized coefficient of role ambiguity predicting organizational commitment was 0.353 as compared to the path from strain to organizational commitment with $\beta = .146$, $p < .05$. Without the direct path of role ambiguity and role conflict, the estimated standardized coefficient of strain predicting organizational commitment was $\beta = 0.355$, $p < .05$. This further investigation provided some evidence of the spuriousness of the relationship between strain and organizational commitment.

The potential spuriousness of the relationship between strain and organizational commitment deserves some discussion. One reason may be that organizational commitment might not be directly related to strain. In fact, the direct effect of strain on organizational commitment at time 2 data was not significant, $\beta = .091$, $p > .05$. Instead, role conflict that was characterized as the incompatibility between expectations and demand had a stronger relationship with organizational commitment $\beta = .156$, $p < .05$ as compared to the contribution of strain, $\beta = .146$, $p < .05$. The estimated coefficient path from strain to organizational commitment in the proposed model was $\beta = .355$, $p < .05$. It shows that role stressors were more important determinants of organizational commitment. This is consistent with the previous studies (Meyer & Allen, 1997; Rhoades & Eisenberger, 2001), which indicate that organizational commitment was strongly related to organizational systems such as organizational support, rewards and procedural justice.

It is imperative that this study comes to a realization that there are overarching effects of role stressors on the outcome of strain. The realized effect might depend on environmental and occupational context. However, it has become obvious that role ambiguity is indeed an important role stressor for academics in Malaysian public universities, though the relative contributions of role overload and role conflict remain significant. It is therefore necessary for academic managers to understand the basic role stress theory in order to manage stress among academics at the optimum levels.

CONCLUSION

To conclude, the direct effects of role stressors on outcomes of strain also seem to suggest that role stress studies that attempt to demonstrate the association between role stressors and strain, are likely to produce a possible bias, that is, an underestimation of the effects of role stressors on the outcomes of strain. The findings of this study therefore found support for the theoretical model, which hypothesized that strain would mediate the effect of role stressors on the

cynicism, professional efficacy, and organizational commitment. Moreover, the parameters that were shown to be relatively invariant across T1 and T2 samples indicate that the model represents the structural stress process among academics in Malaysian public universities.

REFERENCES

- Agarwal, S. and Ramaswami, S.N. (1993) Affective Organizational Commitment of Salespeople: An Expanded Model, *Journal of Personal Selling & Sales Management*, **13(2)**, 49–70.
- Allen, N. and Meyer, J. (1996) Affective, Continuance and Normative Commitment to the Organization: An Examination of Construct Validity, *Journal of Vocational Behavior*, **49(3)**, 252–276.
- Arbuckle, J.L. (2004) *Amos 5.0 User's Guide*. Chicago: SmallWaters Corporation.
- Ashforth, B.E. and Lee, R.T. (1990) Defensive Behavior in Organizations: A Preliminary Model, *Human Relations*, **43**, 621–48.
- Bakker, A.B., Demerouti, E., Taris, T.W., Schaufeli, W.B. and Schreurs, P.J.G. (2003) A Multigroup Analysis of the Job Demands-Resources Model in Four Home Care Organizations, *International Journal of Stress Management*, **10(1)**, 16–38.
- Boomsma, A. (2000) Reporting Analyses of Covariance Structures, *Structural Equation Modeling*, **7**, 461–483.
- Bowling, A. (1997) *Measuring Health: A Review of Quality of Life Measurement Scales*. Open University Press: Buckingham.
- Browne, H.W. and Cudeck, R. (1993) Alternative Ways of Assessing Model Fit, in *Testing Structural Equations Models* (Eds.) K.A. Bollen and J.S. Long, Editors, Newbury Park, CA: Sage Publications, pp. 136–162.
- Conley, S. and Woosley, S.A. (2000) Teacher Role Stress, Higher Needs and Work Outcomes, *Journal of Educational Administration*, **38(2)**, 179–201.
- Cordes, C.L. and Dougherty, T.M. (1993) A Review and Integration of Research on Job Burnout, *Academy of Management Review*, **18**, 621–656.
- Cox, T. (1978) *Stress*. Baltimore: University Park Press.
- Cudeck, R. and Browne, M.W. (1983) Cross-validation of Covariance Structures, *Multivariate Behavioral Research*, **18(4)**, 147–167.
- Demerouti, A., Bakker, A.B., Vardakou, I. and Kantas, A. (2003) The Convergent Validity of Two Burnout Instruments: A Multitrait-multimethod Analysis, *European Journal of Psychological Assessment*, **19(1)**, 12–23.
- Dollard, M.F., Winefield, H.R., Winefield, A.H. and de Jonge, J. (2000) Psychosocial Job Strain and Productivity in Human Service Workers: A Test of the Demand-control-support Model, *Journal of Occupational & Organizational Psychology*, **73(4)**, 501–510.

- Dua, J.K. (1994) Job Stressors and Their Effects on Physical Health, Emotional Health and Job Satisfaction in a University, *Journal of Educational Administration*, **32**, 58–78.
- Evers, W. and Tomic, W. (2003) Students's Perceptions of the Incidence of Burnout Among Their Teachers, *Research in Education*, **69**, 1–15.
- Fan, X., Thompson B. and Wang, L. (1999) Effects of Sample Size, Estimation Methods, and Model Specification on Structural Equation Modeling Fit Indexes, *Structural Equation Modeling*, **6**, 56–83.
- Fogarty, T.J., Singh, J., Rhoads, G.K., and Moore, R.K. (2000) Antecedents and Consequences of Burnout in Accounting: Beyond the Role Stress Model, *Behavioral Research in Accounting*, **12**, 31–67.
- Folkman, S and Lazarus, R.S. (1988) Coping as a Mediator of Emotion, *Journal of Personality and Social Psychology*, **54(3)**, 466–475.
- Gillespie, N.A., Walsh, M., Winefield, A.H., Dua, J. and Stough, C. (2001) Occupational Stress in Universities: Staff Perceptions of the Causes, Consequences and Moderators of Stress, *Work & Stress*, **15**, 53–72.
- Goldberg, D.P. (1978) *Manual of the General Health Questionnaire*. National Foundation for Education Research: Slough, England.
- Golembiewski, R.T., Munzenrider, R.F. and Stevenson, J. (1986) *Stress in Organization*. New York: Praeger.
- Hair, Jr J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2006) *Multivariate Data Analysis* (6th edn.). NJ: Prentice Hall.
- Hu, L.T. and Bentler, P.M. (1995) Evaluating Model Fit, in *Structural Equation Modeling: Concepts, Issues and Applications* (Ed.) R.H. Hoyle, Sage Publication: Thousand Oaks, CA., pp. 76-99.
- Igbaria, M. and Greenhaus, J. (1992) Determinants of MIS Employee's Turnover Intentions: A Structural Equation Model, *Communication of the ECM*, **35(2)**, 35–49.
- Ivancevich, J.M. and Matteson, M.T. (1980) *Stress and Work*. Glenview, IL: Scott, Forestman and Co.
- Jackson, S. and Schuler, R. (1985). A Meta-analysis and Conceptual Critique of Research on Role Ambiguity and Role Conflict in Work Settings, *Organizational Behavior and Human Decision Processes*, **36**, 16–78.
- Janssen, P.P.M., De Jonge, J. and Bakker, A.B. (1999) Specific Determinants of Intrinsic Work Motivation, Burnout and Turnover Intentions: A Study Among Nurses, *Journal of Advanced Nursing*, **29**, 1360–1369.
- Jöreskog, K.G. and Sörbom, D. (1984) LISREL VI: *Analysis of Linear Structural Relationships by the Method of Maximum Likelihood: User's Guide*. Mooresville IN: Scientific Software, Inc.
- Kahn, R. (1980) Conflict, Ambiguity, and Overload: Three Elements in Job Stress, in *The study of Organizations* (Eds.) D. Katz, R. Kahn, J. Adams, San Francisco, CA, Jossey-Bass, (pp. 418–28)

- Kahn, R.L., Wolfe, D.M., Quinn, R.P., and Snoek, J.D. (1964) *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: Wiley.
- Kelloway, E.K. and Barling, J. (1991) Job Characteristics, Role Stress and Mental Health, *Journal of Occupational Psychology*, **63**, 291–304.
- Koeske, G.F. and Koeske, R.D. (1993) A Preliminary Test of a Stress-strain-outcome Model for Reconceptualizing the Burnout Phenomenon, *Journal of Social Service Research*, **17(3/4)**, 107–135.
- Landsbergis, P.A., Schnall, P.L., Belkić, K.L., Baker, D., Schwartz, J. and Pickering, T.G. (2001) Work Stressors and Cardiovascular Disease, *Work: A Journal of Assessment and Prevention*, **17(3)**, 191–208.
- Lazarus, R.S. (1999) *Stress and Emotion: A New Synthesis*. New York: Springer.
- Lazarus, R.S. and Folkman, S. (1984) *Stress, Appraisal and Coping*. New York: Springer.
- Lee, T.R. and Ashforth, B.E. (1993) A Longitudinal Study of Burnout Among Supervisors and Managers: Comparisons between the Leiter and Maslach (1988) and Golembiewski *et al.* (1986) models, *Organizational Behavior and Human Decision Processes*, **54**, 369–398.
- Lee, R.T. and Ashforth, B.E. (1996) A Meta-analytic Examination of the Correlates of the Three Dimension of Job Burnout, *Journal of Applied Psychology*, **81**, 123–133.
- Leiter, M.P. (1993) Burnout as a Developmental Process: Consideration of Models, in *Professional Burnout: Recent Developments in Theory and Research* (Eds.) W.B. Schaufeli, C. Maslach and T. Marek, Washington, DC: Taylor & Francis, pp. 237–250.
- Maslach, C. (1982) Burnout: A Social Psychological Analysis, in *The Burnout Syndrome: Current Research, Theory, Interventions* (Ed.) J.W. Jones, London House Press: Parke Ridge, IL., pp. 30-53.
- Mathieu, J. and Zajac, E. (1990) A Review and Meta-analysis of the Antecedents, Correlates and Consequences of Organizational Commitment, *Psychological Bulletin*, **108**, 171–194.
- Meyer, J.P. and Allen, N.J. (1997) *Commitment in the Workplace: Theory, Research, and Application*. Thousand Oaks, CA: Sage Publications.
- Mor Barak, M.E., Nissly, J.A. and Levin, A. (2001) Antecedents to Retention and Turnover Among Child Welfare, Social Work, and Other Human Service Employees: What Can We Learn from Past Research? A Review and Meta-analysis, *Social Service Review*, **75(4)**, 625–659.
- Mowday, R.T., Steers, R.M. and Porter, L.W. (1979) The Measurement of Organizational Commitment, *Journal of Vocational Behavior*, **14**, 224–247.
- O'Driscoll, M.P. and Beehr, T.A. (1994) Supervisor Behaviors, Role Stressors and Uncertainty as Predictors of Personal Outcomes for Subordinates, *Journal of Organizational Behavior*, **15(2)**, 141–154.

- Parasuraman, S. (1982) Predicting Turnover Intention and Turnover Behavior: A Multivariate Analysis, *Journal of Vocational Behavior*, **21**, 111–121.
- Parasuraman, S. and Alutto, J.A. (1984) Sources and Outcomes of Stress in Organizational Setting: Toward the Development of a Structural Model, *Academy of Management Journal*, **27(2)**, 330–350.
- Peiro, J.M., Gonzalez-Roma, V., Tordera, N. and Manas, M.A. (2001) Does Role Stress Predict Burnout Over Time Among Health Care Professionals?, *Psychology & Health*, **16(5)**, 511–525.
- Posig, M. and Kickul, J. (2003) Extending Our Understanding of Burnout: Test of an Integrated Model in Nonservice Occupations, *Journal of Occupational Health Psychology*, **8(1)**, 3–19.
- Powell, T. (2000) *The Mental Health Handbook*. Bicester: Speechmark,
- Rhoades, L. and Eisenberger, R. (2002) Perceived Organizational Support: A Review of the Literature, *Journal of Applied Psychology*, **87(4)**, 698–714.
- Rhoades, L., Eisenberger, R. and Armeli, S. (2001) Affective Commitment to the Organization: The Contribution of Perceived Organizational Support, *Journal of Applied Psychology*, **86(5)**, 825–836.
- Rizzo, J.R., House, R.J. and Lirtzman, S.I. (1970) Role Conflict and Ambiguity in Complex Organizations, *Administrative Science Quarterly*, **15**, 150–163.
- Schaubroeck, J., Cotton, J.L. and Jennings, K.R. (1989) Antecedents and Consequences of Role Stress: A Covariance Structure Analysis, *Journal of Organizational Behavior*, **2(1)**, 35–58.
- Schaufeli, W.B., Leiter, M.P., Maslach, C. and Jackson, S.E. (1996) MBI-General Survey, in *Maslach Burnout Inventory manual* (3rd edn.) (Eds.) C. Maslach, S.E. Jackson & M.P. Leiter, Consulting Psychologists Press: Palo Alto, CA.
- Schaufeli W.B., Maslach C. and Marek T. (1993) *Professional Burnout: Recent Developments in Theory and Research*. Washington, DC: Taylor & Francis.
- Schaufeli, W.B., Salanova, M., González-romá, V. and Bakker, A.B. (2002) The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach, *Journal of Happiness Studies*, **3(1)**, 71–93.
- Schwab, R. and Iwanicki, E. (1982) Perceived Role Conflict, Role Ambiguity, and Teacher Burnout, *Educational Administration Quarterly*, **18(1)**, 60–74.
- Shutte, N., Toppinen, S., Kalimo, R. and Schaufeli, W.B. (2000) The Factorial Validity of the Maslach Burnout Inventory — General Survey Across Occupational Groups and Nations, *Journal of Occupational and Organizational Psychology*, **73**, 53–66.
- Siegal, M. and McDonald, T. (2004) Person-organization Value Congruence, Burnout and Diversion of Resources, *Personnel Review*, **33(3)**, 291–301.
- Smith, R.E. (1989) Effects of Coping Skills Training on Generalized Self-efficacy and Locus of Control, *Journal of Personality and Social Psychology*, **56**, 228–233.

- Smith, C.A., and Lazarus, R.S. (1990) Emotion and Adaptation, in *Handbook of personality: Theory and Research* (Ed.) L.A. Pervin, Guilford: New York, pp. 609–637.
- Somers, M. and Birnbaum, D. (2000) Exploring the Relationship between Commitment Profiles and Work Attitudes, Employee Withdrawal, and Job Performance, *Public Personnel Management*, **29(3)**, 353–364.
- Spector, P.E. and Jex, S.M. (1998) Development of Four Self-report Measures of Job Stressors and Strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory, *Journal of Occupational Health Psychology*, **3(4)**, 356–367.
- Tait, R.J., French, D.J. and Hulse, G.K. (2003) Validity and Psychometric Properties of the General Health Questionnaire-12 in Young Australian Adolescents, *Australian & New Zealand Journal of Psychiatry*, **37(3)**, 374–381.
- Taris, T.W., Schreur, P.J.G. and Van Iersel-Van Silfhout, I.J. (2001) Job Stress, Job Strain, and Psychological Withdrawal Among Dutch University Staff: Towards a Dual Process Model for the Effects of Occupational Stress, *Work & Stress*, **15**, 283–296.
- Wasti, S.A. (2003) Organizational Commitment, Turnover Intentions and the Influence of Cultural Values, *Journal of Occupational & Organizational Psychology*, **76(3)**, 303–21.
- Weisberg, J. (1994) Measuring Workers' Burnout and Intention to Leave, *International Journal of Manpower*, **15(1)**, 4–14.
- Winefield, A.H. (2000) Stress in Academe. Some Recent Research Findings, in *Stress and Health: Research and Clinical Application* (Eds.) D.T. Kenny, J.G. Carlson, F.J. McGuigan & J.L. Sheppard, Harwood: Sydney, pp. 437–446.