TESTING A MODEL OF OCCUPATIONAL STRESS ACROSS DIFFERENT COUNTRIES†

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The present study examines the generalizability of a previously validated model of occupational stress across three different countries: Great Britain, United States, and the Federal Republic of Germany. Data were collected from 464 individuals employed in professional positions in the three countries. The results demonstrate the invariance of the proposed model of stress, where personality and coping strategies were shown to precede and determine the perception of job stressors which, in turn, were shown to have an impact on the well-being of the individual. Implications of the findings for research and practice are outlined in the concluding sections.

Occupational stress may be defined as a situation wherein factors interact with a worker to change (i.e., disrupt or enhance) his/her psychological and/or physiological condition,

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such that the person is forced to deviate from normal functioning (Beehr and Newman, 1978). The National Institute for Occupational Safety and Health (NIOSH) rates stress as one of the ten leading work-related diseases (Minter, 1991). Occupational stress-related expenses in the United States currently total more than $150 billion annually. Stress-related disability claims in the United States have risen by approximately 700 per cent over the past five years with the direct cost of resolving a single stress claim estimated at between $10,000 and $15,000 (Stevens, 1992). In Britain, the cost of stress-related illness is estimated at approximately 10 per cent of the gross national product per annum. The British Heart Foundation calculates that for a company of 10,000 employees, lost productive value from stress-related heart disease will add up to 73,000 working days, 42 employees and 2.5 million pounds per year.

A considerable amount of research has been devoted to the topic of occupational stress. To a large extent, much of the occupational stress research has adopted an interactionist perspective where stress is seen as a product of the relationship between a person and his/her environment (Caplan, Cobb, French, Van Harrison & Pinneau, 1975; Greenhaus & Parasuraman, 1987; Lazarus, 1991; Stogdill, 1974). Personal variables include both aspects of individual personality (e.g., Type A behavior, Locus of Control, Negative Affectivity) and methods of coping (e.g., exercise, drinking, social support), while environmental variables are depicted as a range of potential stressors. The eventual outcome of the person-environment interaction is likely to affect, in turn, the person (either physiologically, psychologically, or behaviorally) and his/her environment (Beehr & Newman, 1978; Cooper, 1986; Cooper, Cooper & Eaker, 1988; Cooper & Payne, 1978; Greenhaus & Parasuraman, 1987; Robbins, 1993).

Recently, a considerable number of studies have focused on occupational stress in various countries. For example, a series of studies assessing executive stress across 11 countries (Sweden, Germany, United States, South Africa, Britain, Japan, Singapore, Nigeria, Brazil, Egypt and New Zealand) found that executives from countries undergoing large economic and social change (i.e., Egypt, Brazil, Nigeria, Singapore) showed the highest mental ill-health scores, while the more developed countries (i.e., Sweden, New Zealand, Germany, United States) showed lower levels of anxiety, depression and psychosomatic tendencies. Patterns of job dissatisfaction tended to mirror the mental health findings. Executives from Egypt, Brazil, Japan and Singapore, respectively, expressed the highest levels of job dissatisfaction and executives from New Zealand, Germany, Sweden, and South Africa expressed the lowest levels of job dissatisfaction (Cooper, 1984; Cooper & Hensman, 1985; McCormick & Cooper, 1988). A study of 118 European executives showed that 25 percent of the sample believed that they were at substantial risk of job burnout (physical and emotional exhaustion) and at high risk from heart disease (Cooper & Sutherland, 1991). Kirkcaldy and Cooper (1994) compared senior police officers from Berlin and Northern Ireland and found that the German officers showed higher levels of stress (especially at the levels of home-work interface and career and achievement) and used a greater variety of coping strategies than the officers in Northern Ireland.

While these types of cross-country comparisons are interesting, they convey little information about the generalizability of the process of occupational stress across different countries. A number of studies have addressed this issue. For example, a comparative study of American and Indian salespersons showed that the effect of formalization on role stress, organizational commitment and work alienation was different. Overall, the American sample reacted more negatively to organizational formalization than the Indian sample. Both job codification and rule observation had a greater dysfunctional influence on role ambiguity for salespersons in the U.S. than in India. Rule observation had a stronger negative influence on role conflict for the American sample than for the Indian sample (Agarwal, 1993). A study of German and British managers showed some absolute differences between the two countries (e.g., German managers expressed higher sources of job-related pressure, higher levels of coping and significantly better mental health); however, the nature of relationships amongst variables was replicated across both national groups (Kirkcaldy & Cooper, 1992). The present study aims to extend the initial study by Kirkcaldy and Cooper (1992) by examining the generalizability of a previously validated model of occupational stress (Sadri and Marcoulides, 1994) across three countries: Great Britain (Britain), United States (U.S.), and The Federal Republic of Germany (F.R.G.). We aim to examine the cross-cultural applicability of a model of the stress process.

A Model of the Stress Process

Cooper and Baglioni (1988) and Robertson, Cooper and Williams (1990) found empirical support for an indigenous model of stress, where personality and coping strategies preceded and determined the perception of job stressors which, in turn, had an impact on the mental well-being of the individual. Sadri & Marcoulides (1994) provided empirical support for an extended version of this model of stress, shown in Figure 1.

Figure 1 indicates that there are three sets of latent variables included in the model, called (i) Precursors of Stress, (ii) Stressors and (iii) Outcomes. Multiple observed indicators were used to measure all of the latent variables included in the model as prescribed in the literature (e.g., Harris & Schaubroeck, 1990).

Precursors of Stress

Figure 1 shows three latent variables that may be considered precursors of stress: Type A behavior, Locus of Control and methods of coping.

Type A Behavior. Type A behavior, characterized by a chronic sense of time urgency and an excessive competitive drive, shows a clear link with stress-related outcomes. Type A individuals underestimate the time required to accomplish tasks and therefore, experience time pressures. They work quickly and show impatience and decreased work performance if forced to work slowly. Type A's ignore, suppress, or deny physical or psychological symptoms while

working under pressure, and report such symptoms only when the work is finished. They work harder and experience physiological arousal when a task is perceived as challenging; express hostility and irritation in response to a challenge or threat; and need to be in control of the immediate environment to such an extent that a lack of control may elicit a hostile, competitive response (Friedman & Rosenman, 1974; Froggatt and Cotton, 1987; Ganster, Sime & Mayes, 1989; Williams, 1989).

Locus of Control. Locus of Control (LOC) is represented by a continuum with individuals who believe that they are masters of their fate falling on the internal side of the continuum and those who believe that their lives are reliant on luck, chance, fate or powerful others falling on the external side (Rotter, 1966). A number of studies imply that internals perceive their jobs to be less stressful than do externals. Internals report fewer psychological strains resulting from job specificity; fewer somatic complaints as a result of role conflict; and are less likely to respond to normal organizational frustrations with aggression, sabotage, or withdrawal than are externals (Anderson, Hellriegel and Slocum, 1977; Fusilier, Ganster and Mayes, 1987; Gemmill and Heisler, 1972; Marino and White, 1985; Storms and Spector, 1987).

There is a distinction in the literature on LOC between state and trait measures of control (Parkes, 1984). Trait measures like that designed by Rotter represent a *generalized* belief about the extent to which important outcomes are controllable (Rotter, 1966). The measure used in the present study represents a state measure, or a subjective appraisal of control of the individuals' work situation and has demonstrated a relationship with important aspects of the individual's work experience and well-being (Rees & Cooper, 1992).

Coping Methods. Coping refers to behavior that mediates the impact that societies have on their members through protecting people from being psychologically harmed by problematic social experience (Pearlin & Schooler, 1978). The present model suggests that there are likely to be individual differences in the methods that people adopt to cope with given situations and that the coping alternatives that are perceived to be available to each person will affect his/her subsequent perception of stressful events. There is prior evidence that coping is an active, continuous force, shaping what will occur during subsequent coping episodes and that individuals are relatively consistent in the coping strategies which they adopt (Cohen & Edwards, 1988; Dolan & White, 1988; Fleishman, 1984). Research also indicates that the mere existence of forms of coping, such as social support networks (irrespective of whether or not they are used), serves to act as a buffer against stress (Cummings, 1990; House, 1981; Jayaratne, Himle & Chess, 1988).

For the present project, six methods which people commonly adopt to cope with work stress are measured: (i) Social support (the degree to which individuals rely on others as a means of coping with stress); (ii) task strategies (the degree to which individuals cope through strategies directed at reorganizing their work, such as planning ahead, setting priorities, and delegating);

(iii) logic (coping through attempts to be rational and handle situations in an objective manner); (iv) home and work relationship (the extent to which home is viewed as a refuge, and the existence of interests and activities that a person engages in outside of work); (v) time (the individual's use of time, e.g., whether he/she deals with problems immediately rather than stalling); and (vi) involvement (the degree to which the individual forces himself/herself to come to terms with reality, through strategies like recognizing his/her limitations, being able to release tension, and concentrating on specific problems).

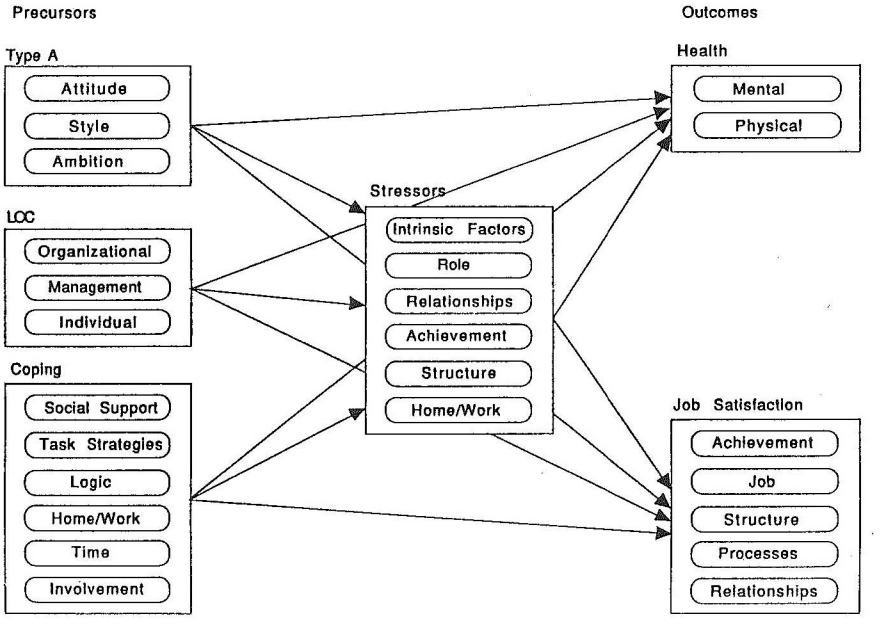
Stressors

There is a range of environmental factors, in the workplace and at the work-nonwork interface, which have been linked to stress-related outcomes (Cooper, 1986; Cooper & Marshall, 1976; Frew & Bruning, 1987; Jackson & Schuler, 1985; Van Sell, Brief & Schuler, 1981). The present study examines six potential sources of stress. These include stress arising from: (i) factors intrinsic to the job, e.g., having too much work to do, and having to work long hours; (ii) a lack of power and influence, ambiguity, conflicting tasks and demands arising from multiple roles that the individual plays; (iii) relationships with other people, such as coping with office politics, having to supervise others, lack of support from colleagues, and lack of encouragement from superiors; (iv) how valued people feel and whether or not they are satisfied with their opportunities for advancement at work; (v) the structure or climate of an organization, in terms of inadequate guidance from superiors, poor quality training and development programs, evidence of discrimination or favoritism; (vi) the home/work interface, which may include things like having to take work home, or inability to forget about work when the individual is at home.

Outcomes

The experience of stressful events might result in one or all of three types of outcomes: physiological, psychological and behavioral (Beehr & Newman, 1978; Cooper & Marshall, 1976; Steffy & Jones, 1988). The present study examines stress-related outcomes on all of these levels. Physiological symptoms measured include headaches, indigestion, shortness of breath, increases in blood pressure, feelings of exhaustion. Psychological manifestations of stress include aspects of mental health (such as inability to think clearly, feeling restless, and irritability) and work-related attitudes (i.e., job satisfaction). Five aspects of job satisfaction are included in the study: (i) the extent to which one is valued and opportunities for growth; (ii) aspects of the job itself (e.g., security); (iii) organization design and structure; (iv) organizational processes (e.g., supervision); and (v) relationships with other (e.g., peers, superiors, subordinates). Behavioral outcomes assessed include changes in eating, drinking, smoking patterns and sleeplessness.

Figure 1: Proposed Model of Link between Personality, Coping, Stressors & Outcomes



Cross-Cultural Predictions about the Model

In attempting to determine whether the model of stress depicted in Figure 1 might differ across the three countries, it becomes necessary to examine the extent to which the cultures themselves vary. While we acknowledge the presence of minority cultures within each of the countries included in the present study, the present review is concerned with the dominant/mainstream cultures which emerge from these countries. Few studies have been conducted on differences between the countries included in the present study. In a study of British and German college students, Kirkcaldy, Furnham and Lynn (1992) found that the British sample showed a higher work ethic, achievement motivation, competitiveness and tended to prefer business-oriented occupations rather than the professions (medicine, social work and teaching). Furnham, Kirkcaldy and Lynn (1994) found that samples from North and South America scored higher than those from European countries on work ethic and mastery. Empirical research on differences across a broader range of countries is even more scarce. One notable exception is the study conducted by Hofstede who surveyed 116,000 employees in 39 countries, all working for the same multinational corporation (Hofstede, 1984, 1991). Hofstede's study showed that four dimensions of national culture had a major impact on employees' work-related values and attitudes: Power Distance, Uncertainty Avoidance, Individualism versus Collectivism, and Masculinity versus Femininity (also referred to Quantity versus Quality of Life, Robbins, 1993). Comparing the three countries included in this study (Britain, F.R.G. and U.S.) across these dimensions identifies a number of similarities and differences. On the two dimensions of Power Distance (the pattern of interpersonal relationships when differences in power are perceived) and Masculinity versus Femininity (the degree to which countries value the acquisition of money, material things, and assertiveness [masculine] as opposed to meaningful relationships and the overall quality of life [feminine]), the U.S., Britain and F.R.G. exhibit very similar patterns. All are below average on Power Distance and above average on Masculinity. The dimension of Uncertainty Avoidance (the extent to which people are threatened by ambiguous situations or stimuli and have beliefs and institutions that help them to avoid this uncertainty) identifies one major difference in the three cultures examined here: the U.S. and Britain are both below average whereas Germany is above average on this construct. The dimension of Individualism (the extent to which individuals are concerned with the welfare of themselves and their immediate family as opposed to the welfare of the group) also identifies a slight departure in German culture from that found in the U.S. and Britain. The latter two are both very high on this dimension while the F.R.G. is much lower, although still above average.

There are a number of other labels which appear useful in explaining cultural differences which we would like to consider here. The first of these is high-context vs. low-context. In high-context cultures, people rely heavily on situational cues such as status or position for meaning when communicating with others. In low-context cultures, written and spoken words are heavily relied upon in important communication. The U.S., F.R.G and Britain are all classified as low-context cultures (Dulek, Fielden & Hill, 1991). A second cultural difference factor is

reflected in perceptions of time - monochronic vs. polychronic. Monochronic cultures adopt an ordered, precise, schedule-driven use of time. Northern Europeans and North Americans use this type of orientation. Polychronic cultures like the Mediterranean, Latin American and Arab adopt a more cyclical view of time, engaging concurrently in activities with different people (Moore, 1990). A third factor is that of interpersonal space. People from high-context cultures typically stand closer to another person when engaging in interpersonal communications whereas people from low-context cultures (like Britain, the F.R.G. and the U.S.) tend to prefer a greater degree of interpersonal space (Hall, 1966). A fourth and final factor which reflects a somewhat similar pattern across the three countries under present study is that of religion. In comparing five of the major religious affiliations adopted internationally (Catholic, Protestant, Buddhist, Muslim and no religious preference), the three affiliations of Catholic, Protestant and no preference would appear to be well represented in all three countries and the remaining two affiliations of Buddhism and Muslim much less well represented (Kreitner & Kinicki, 1992).

In summary, it would appear that the three countries involved in the present research (Britain, U.S. and F.R.G) have largely similar patterns of dominant cultural beliefs, values and practices. Therefore, we hypothesize that the causal flow of the stress process will be replicated across these cultures.

METHOD

Subjects

Data were collected from 464 individuals occupying professional positions in the U.S., Britain and F.R.G.: 235 in the U.S., 123 in Britain and 106 in the F.R.G. The U.S. data was collected from professionals employed in diverse companies within the Southern California Orange County area. Approximately 40 percent of the data was collected as part of a series of university management education seminars attended by participants, the response rate for this portion of the data was 90 percent. The remaining 60 percent of the data was collected from respondents at four different worksites for research purposes, including two manufacturing companies, a waste management organization and an insurance company. The response rate across the four sites averaged at 57 percent. The British subjects were drawn from executive management programs being run in British university business schools. The subjects were middle and senior managers employed by a number of diverse companies in Britain, occupying a variety of occupations (including marketing, general management and production management). The response rate for the British sample was approximately 85 percent. The majority of the German sample were also middle and senior executives enrolled in executive management programs in Liblar. A small number of subjects were drawn from diverse companies in the North-Rhine Westfalia area of Germany. The response rate for the entire German sample averaged at approximately 80 percent. The sample from Germany also held a

range of different positions, including operations management, information technology, sales and marketing, research and development, quality assurance and human resourcing.

Across the entire sample, 70 percent are male and 30 percent female. The median age of the sample is between 21 and 36 (61percent); 32 percent were aged 37-55; two percent were under 21 and five percent over 55 at the time of data collection.

Questionnaire

All variables were measured using the Occupational Stress Indicator (O.S.I.) which consists of 167 variables and has been shown to be reliable and related to managerial and professional occupations (Cooper & Marshall, 1976; Cooper, Sloan & Williams, 1988; Kirkcaldy & Hodapp, 1989; Schuler, 1980). The O.S.I. is made up of six questionnaires, which measure different dimensions of stress: Type A personality (14 items); locus of control (12 items); coping strategies (28 items); sources of pressure (61 items); job satisfaction (22 items); and current state of health (30 items). The questionnaire took approximately 35 minutes to complete. Descriptions of the observed variables grouped according to the constructs they are proposed to measure are provided in Appendix A. The observed variables are paraphrased from the original questionnaire used in the study (Cooper et al., 1988). The same version of the questionnaire was used for the U.S. and British samples. For the German sample, the questionnaire was translated into German by a native German psychologist with experience in the research in the field of psychology and then was back-translated into English by the fourth author to check for accuracy.

RESULTS

This study attempted to determine whether there is or is not a difference in the structure of the model of occupational stress across managers from three countries. If the model is not similar, to what degree does it differ and how? In the methodological literature, tests of these hypotheses are generally referred to as testing the invariance of a proposed model. The value of any proposed model is greatly enhanced if the same model can be replicated in samples from similar and from different populations (Heck & Marcoulides, 1989).

The invariance of the model of the occupational stress process was tested in this study using LISREL VIII (Jöreskog & Sörbom, 1993). In the LISREL approach to testing invariance, the same model is fit to covariance matrices from the different groups. The fit of the model is subsequently examined in order to determine whether the model and the parameter estimates of the model are the same across the different cultural groups.

Assessment of the fit of the model across the three countries in the present study was based upon several criteria. Statistical criteria include the goodness of fit index (GFI), the root mean square residual (RMR), and the ratio of the chi square to degrees of freedom (x^2/df). Practical criteria include the Bentler and Bonett (1980) normed index (NFI). Selection of these indices to test the model was based on their widespread use and their usefulness in comparing samples of unequal sizes (Marsh, Balla & McDonald, 1988).

Table 1
GOODNESS OF FIT INDICES

Index	Value		
	U.S	U.K.	FRG
Goodness-of-fit index	0.93	0.94	0.95
Chi-Square: degrees of freedom ratio	1.95	1.00	0.79
Root Mean Square Residual	0.08	0.07	0.07
Normed Fit Index	0.93	0.90	0.92

Table 1 presents the criteria describing the fit of the proposed model of stress. The assessment of the fit of the model to the data from each country is revealed by examining the goodness of fit index, the root mean square residual, the ratio of the chi square to the degrees of freedom, and the normed index. It is generally recognized that GFI and NFI values above .90 indicate a satisfactory model fit. For this model these indices all suggest a reasonably good model fit. The GFI and NFI can be considered measures of the relative amount of variance and covariance in the data accounted for by the proposed model. On the other hand, the root mean square residual is a measure of the average unexplained variances and covariances in the model. This index should be close to zero if the data fits the model. The observed RMRs are all very small, indicating that very few of the variances and covariances are unexplained by the proposed model. A ratio of the chi-square to the degrees of freedom ranging from one to five also indicates a reasonable fit of the model, although recent research indicates that this ratio should be closer to two (Byrne, 1989; Wheaton, Muthen, Alwin & Summers, 1977). In this study the observed ratios are 1.95, 1.00 and 0.79 for the U.S, Britain and F.R.G. respectively. Finally, parameter estimates with t-ratios that are greater than two are considered to provide evidence that the parameter is significantly different from zero and important to the proposed model. Estimates of the direct and indirect effects of the variables in the model were also tested through t tests, and all parameters were found to be significant ($p < .01$). Given the variety of tests that were used to assess the fit of the model, we would consider that the model fairly accurately accounts for the observed variability in the data from each country.

Table 2
PROPORTION OF VARIANCE EXPLAINED BY THE MODEL FOR EACH OUTCOME VARIABLE

COUNTRY	JOBSAT	HEALTH
U.S.	59%	63%
U.K.	47%	77%
F.R.G.	40%	45%

A second goal of the analysis in this study was to estimate the relative strength of the proposed variables in explaining the stress process and to assess how much variance in the outcomes can be accounted for by the theoretical model. Table 2 presents the proportion of variance in the outcome variables (job satisfaction and health) accounted for by the variables included in the model for each country. As can be seen, a large portion of the variability in health can be accounted for. Similarly, almost half of the variability in individuals' job satisfaction can be accounted for by the other variables measured as part of the study across each of the three countries included in the analysis.

Table 3
PARAMETER ESTIMATES FOR STRUCTURAL EQUATIONS OF CONSTRUCTS

	STRESSORS	JOBSAT	HEALTH	TYPE A	LOCUS	COPING
STRESSORS	--	--	--	0.37	0.51	0.02
JOBSAT	0.07	--	--	-0.32	-0.67	0.26
HEALTH	0.26	--	--	0.27	0.59	-0.38
STRESSORS	--	--	--	0.17	0.41	0.02
JOBSAT	0.15	--	--	-0.18	-0.70	0.07
HEALTH	0.36	--	--	0.50	0.79	-0.27
STRESSORS	--	--	--	0.14	1.45	0.16
JOBSAT	0.03	--	--	-0.42	-0.39	0.08
HEALTH	0.38	--	--	0.13	0.28	-0.36

Table 3 presents the parameter estimates for the contribution of each latent variable in the model for each country. As can be seen, there are some small differences in the relative importance of each variable in the model. Although none of the observed differences reach a

level of statistical significance, a brief review of the findings for each country may be of interest. For the U.S., the greatest predictor of perception of stressors, job satisfaction and health-related outcomes is locus of control. Locus of control is also the best predictor of perception of stressors, job satisfaction and health for the British sample included in the present study. For the German sample, the results are slightly different: while locus of control emerges as the best predictor of perception of stressors, type A behavior emerges as a better predictor of job satisfaction and coping appears to be the best predictor of health-related outcomes. The slight difference in observed results for the German sample mirrors previous findings about the degree of variability of the three cultures included here from one another (Hofstede, 1984).

DISCUSSION

The reality of working in multicultural environments, in multinational companies and in a global marketplace have made an understanding of potential cultural differences imperative. Over the past decade, researchers have been trying to determine whether the effect of stress on an individual's well-being is universal or whether cultural values have a mediating effect. This study examined the generalizability of a model of stress across three different countries (Britain, U.S. and F.R.G.). Overall, the results indicate that the model of occupational stress does not differ across the three groups. The present research helped to enhance our understanding of the applicability of the dynamics of workplace on a more global level by examining the influence of personality and coping strategies on the perception of job stressors and in turn, their combined impact on the well-being and job-related attitudes of the individual. Results from the study support the generalizability of the model (shown in Figure 1) across the American, British and German dominant cultures. The present results convey a number of implications for how managers of international as well as national organizations conceptualize and try to cope with workplace stress.

The present results showed that personality (Type A behavior and LOC) determine the perception of stressors and subsequently affect the mental and physical well-being of the individual and his/her job satisfaction. The methods of coping adopted were found not to affect the perception of stressors but they were found to have an impact on the health (physical and mental) and attitudes of respondents. The fit of the proposed model lends support to the assertion that the variables affecting occupational stress can be determined and measured.

One of the important findings from this study is that stress is a function of both individual and organizational factors and implies that attempts to cope with the problem need to focus on the environment as well as the individual. These results help to remove some of the ambiguity that has typically been associated with interpretations of stress-related outcomes where managerial personnel often view stress as a function of maladaptive personal lifestyles whereas labor representatives depict stress as a consequence of organizational structure and design

(Neale, Singer, Schwartz and Schwartz, 1982). The present results indicate that increases in perceptions of stress have a significant effect on the mental and physical ill-health of the individual. If organizations do not attempt to minimize the negative impact of work stress, it is likely to result in severe outcomes for both employee and employer. The issue of stress-related disability legislation is one example of the types of problems that are likely to become more apparent if organizations do not take a proactive stance against workplace stress (Stevens, 1992).

A second very significant finding from the present results is the emergence of LOC as the strongest predictor of perceptions of stress for each of the three countries surveyed. Respondents who indicated a more external LOC also indicated a higher incidence of workplace stressors. For the British and American samples, LOC also emerged as the best predictor of job satisfaction and both mental and physical ill-health, with an external LOC resulting in lower satisfaction and poorer levels of health. While this is consistent with the existing literature on LOC (Anderson et al., 1977; Fusilier et al., 1987; Gemmill & Heisler, 1972; Spector, 1987), it is important to emphasize that the LOC scale contained in the OSI is a state measure. It examines feelings of control over the work environment as opposed to generalized feelings of control. Clearly, there is much that organizations can do to give people more control over the immediate work environment. For example, managers can provide more information to employees on relevant issues such as assessment procedures, company policies and regulations, organizational change and how this is likely to affect individual employees. Previous studies have shown that attempts to increase worker control over the work environment through participation in decision-making, increased job autonomy and increased autonomy over work schedules resulted in positive individual and organizational outcomes (Jackson, 1983; Pierce & Newstrom, 1983; Wall & Clegg, 1981). Future studies will need to assess how this type of information can best be communicated in different cultures (for example, low-context as opposed to high-context cultures).

A third important finding which emerges from the present research is the role of coping in the occupational stress model. Methods of coping, in all three cultures, appeared to have little effect on the perception of job stressors, yet they did help to prevent the symptoms of ill-health.

While it has been suggested that all methods of stress management have the same basic objective of assisting people to minimize their dysfunctional experiences (Matteson & Ivancevich, 1987), there are different ways of categorizing such techniques. For example, stress management may be individual-focussed (refers to actions taken by individuals) or organization-focussed (refers to actions taken by management). DeFrank and Cooper (1987) list the following individual-focussed strategies: relaxation techniques, cognitive strategies, biofeedback, meditation, exercise, EAPs, time management. Research on the benefits of such programs again shows very positive results in terms of the mental and physical health of the employee and his/her work behavior (Cooper & Sadri, 1991; Cooper, Sadri, Allison &

Reynolds, 1990). The following are classified as organization-focussed strategies: adapting organization structure, selection and placement, training, altering physical and environmental job characteristics, emphasizing health concerns and resources, job rotation (DeFrank & Cooper, 1987). An alternative way of conceptualizing stress management strategies is whether the technique emphasizes stressor reduction (primary), stress management (secondary), or a curative approach such as counseling (tertiary; Murphy, 1988). A systematic approach to minimizing stress at all levels (i.e., primary, secondary and tertiary), is likely to be most productive for today's diverse workforce. Results from the present research suggest that primary, organization-focussed strategies such as increasing the level of worker control over the environment are likely to lead to the most positive long-term outcomes.

Results from the present study also indicated that Type A behavior plays an important role in the model of stress. For the present sample, Type A's experienced more pressure, lower job satisfaction, and higher levels of ill-health (mental and physical). Again, this corroborates previous findings on Type A behavior (Froggatt & Cotton, 1987; Ganster et al., 1989; Zylanski & Jenkins, 1970). In terms of stress management, employees may be encouraged to try to limit the dysfunctional aspects of their Type A behavior (e.g., high competitiveness, high hostility). Since most organizational psychologists now accept the importance of environmental and situational factors as determinants of behavior (Robbins, 1993), we suggest that an organization can assist in this process by fostering a culture that is more collaborative than competitive. An interesting path for future research would be to determine whether a more collectivistic cultural orientation might assist organizations in this type of endeavor.

The present study has shown that models of the occupational stress process can be generalized on an international level and that structural equation modeling techniques provide a vital link in this type of research. Further research of this nature is needed across more cultures. Of particular interest would be the replicability of the model with samples from very diverse cultures. Future research on a model of this nature might also utilize additional variables: hardiness and negative affectivity would be good personality variables to include; turnover, absenteeism and productivity would be appropriate behavioral variables and self-esteem and self-efficacy would be appropriate psychological measures. The present research represents as initial step toward evaluating the generalizability of a model of occupational stress across different countries. The present results bear both methodological and substantive implications for future research across international boundaries. Structural equation modeling techniques can make a significant contribution to future research questions concerning the comparison of workers from various countries.

Appendix A

Observed Variables Included in Study

Type A Personality (14 items - 3 subscales)
X1: Attitude to living, e.g., ambition, desire for career progression
X2: Style of behavior, e.g., impatience when listening to another
X3: Ambition, e.g., competitiveness

Locus of Control (12 items - 3 subscales)
X4: Control over organizational forces, e.g., importance of upper management
X5: Control over management processes, e.g., influence of hard work on performance appraisals
X6: Individual influence e.g. belief in luck, chance, fate

Coping Strategies (28 items - 6 subscales)
X7: Social support, e.g., seeking advice from superiors
X8: Task strategies, e.g., reorganizing work
X9: Logic, e.g., attempting to approach problems objectively
X10: Home and work relationship, e.g., activities outside of work
X11: Time management, e.g., forcing oneself to slow down
X12: Involvement, e.g., recognizing one's limitations

Sources of Pressure (61 items - 6 subscales)
Y1: Factors intrinsic to the job, e.g., having too much to do
Y2: The managerial role, e.g., lack of power and influence
Y3: Relationships with other people, e.g., having to supervise others
Y4: Career and achievement, e.g., overpromotion
Y5: Organizational structure and climate, e.g., inadequate guidance from superiors
Y6: Home/work interface, e.g., having to take work home

Job Satisfaction (22 items - 5 subscales)
Y7: Satisfaction with achievement, value and growth, e.g., how much one's efforts are valued
Y8: Satisfaction with the job itself, e.g., job security
Y9: Satisfaction with organizational design and structure, e.g., communication flow
Y10: Satisfaction with organizational processes, e.g., style of supervision
Y11: Satisfaction with personal relationships, e.g., peers

Current State of Health (30 items - 2 subscales)
Y12: Mental health, e.g., changes in self-confidence at work
Y13: Physical health, e.g., sleeplessness

REFERENCES

Agarwal, S. (1993). "Influence of Formalization on Role Stress, Organizational Commitment, and Work Alienation of Salespersons: A Cross-National Comparative Study." ***Journal of International Business Studies***, 24 (4), 715-739.

Anderson, C.R., Hellriegel, D. & Slocum, J.W. (1977). "Managerial Response to Environmental Induced Stress." ***Academy of Management Journal***, 20(2), 260-272.

Beehr, T.A. & Newman, J.E. (1978). "Job Stress, Employee Health, and Organizational Effectiveness: A Facet Analysis, Model and Literature Review." ***Personnel Psychology***, 31(4), 665-699.

Bentler, P. & Bonett, D. (1980). "Significance Tests and Goodness-of-Fit in the Analysis of Covariance Structures." ***Psychological Bulletin***, 88(3), 588-606.

Byrne, B.M. (1989). ***A primer on LISREL***. New York: Springer-Verlag.

Caplan, R.D., Cobb, S., French, J.R.P., Van Harrison, R. & Pinneau, S.R. (1975). ***Job Demands and Worker Health***, Washington, D.C.: HEW Publication No. (NIOSH) 75-160.

Cohen, S. & Edwards, J.R. (1988). "Personality Characteristics as Moderators of the Relationship Between Stress and Disorder." In R.J. Neufeld (Ed.) ***Advances in the Investigation of Psychological Stress***, New York: Wiley.

Cooper, C.L. (1984). "Executive Stress: A Ten-Country Comparison." ***Human Resource Management***, 23(4), 395-407.

Cooper, C.L. (1986). "Job Distress: Recent Research and the Emerging Role of the Clinical Occupational Psychologist." ***Bulletin of the British Psychological Society***, 39(3), 325-331.

Cooper, C.L. & Baglioni Jr, A.J. (1988). "A Structural Model Approach Toward the Development of a Theory of the Link Between Stress and Mental Health." ***British Journal of Medical Psychology***, 61(2), 87-102.

Cooper, C.L., Cooper, R.D. & Eaker, L.H. (1988). ***Living with Stress***, Middlesex, UK: Penguin Books.

Cooper, C.L. & Hensman, R. (1985). "A Comparative Investigation of Executive Stress: A Ten-Nation Study." ***Stress Medicine***, 1(2), 295-301.

Cooper, C.L. & Marshall, J. (1976). "Occupational Sources of Stress: Are View of the Literature Relating to Coronary Heart Disease and Mental Ill-Health." ***Journal of Occupational Psychology***, 49(1), 11-28.

Cooper, C.L. & Payne, R. (1978). ***Stress at Work***, London: John Wiley.

Cooper, C.L. & Sadri, G. (1991). "The Impact of Stress Counseling at Work." ***Journal of Social Behavior and Personality***, 6 (7), 411-423.

Cooper, C.L., Sadri, G., Allison, T. & Reynolds, P. (1990). "Stress Counseling in the Post Office." ***Counseling Psychology Quarterly***, 3 (1), 3-11.

Cooper, C.L., Sloan, S.J. & Williams, S. (1988). ***Occupational Stress Indicator Management Guide***. NFER-Nelson, Oxford, U.K.

Cooper, C.L. & Sutherland, V.J. (1991). "The Stress of the Executive Life Style: Trends in the 1990s." *Employee Relations*, 13(4), 3-7.

Cummings, R.C. (1990). "Job Stress and the Buffering Effect of Supervisory Support." ***Group and Organization Studies***, March, 15(1), 92-104.

DeFrank, R.S. & Cooper, C.L. (1987). "Worksite Stress Management Interventions: Their Effectiveness and Conceptualization." ***Journal of Managerial Psychology***, 2(1), 4-10.

Dolan, C.A. & White, J.W. (1988). "Issues of Consistency and Effectiveness in Coping with Daily Stressors." ***Journal of Research in Personality***, 22(4), 395-407.

Dulek, R.E., Fielden, J.S. & Hill, J.S. (1991). "International Communication: An Executive Primer." ***Business Horizons***, 34(1), 20-26.

Fleishman, J.A. (1984). "Personality Characteristics and Coping Patterns." ***Journal of Health and Social Behavior***, 25(June), 229-244.

Frew, D.R. & Bruning, N.S. (1987). "Perceived Organizational Characteristics and Personality Measures as Predictors of Stress/Strain in the Work Place." ***Journal of Management***, 13(4), 633-646.

Friedman, M. & Rosenman, R.H. (1974). ***Type A Behavior and Your Heart***. New York: Times Books.

Froggatt, K.L. & Cotton, J.L. (1987). "The Impact of Type A Behavior Pattern on Role Overload-Induced Stress and Performance Attributions." ***Journal of Management***, 13(1), 87-90.

Furnham, A.F, Kirkcaldy, B.D. & Lynn, R.A. (1994). "National Attitudes to Competitiveness, Money and Work Among Young People: First, Second and Third World Differences." ***Human Relations***, 47(1), 119-132.

Fusilier, M.R., Ganster, D.C. & Mayes, B.T. (1987). "Effects of Social Support, Role Stress, and Locus of Control on Health." ***Journal of Management***, 13(1), 87-98.

Ganster, D.C., Sime, W.E. & Mayes, B.T. (1989). "Type A Behavior in the Work Setting: A Review and Some New Data." In A.W. Siegman & T.M. Dembroski (Eds.) ***In Search of Coronary-Prone Behavior: Beyond Type A***. Hillsdale, NJ: Erlbaum.

Gemmill, G.R. & Heisler, W.J. (1972). "Fatalism as a Factor in Managerial Job Satisfaction, Job Strain, and Mobility." ***Personnel Psychology***, 25(2), 241-250.

Greenhaus, J.H. & Parasuraman, S. (1987). "A Work-Nonwork Interactive Perspective of Stress and Its Consequences." In M. Ivancevich & D.C. Ganster (Eds.) ***Job Stress: From Theory to Suggestion***, New York: The Howarth Press.

Hall, E.T. (1966). ***The Hidden Dimension***. Garden City, N.Y.: Doubleday.

Harris, M.M. & Schaubroeck, J. (1990). "Confirmatory Modeling in Organizational Behavior/Human Resource Management: Issues and Applications." ***Journal of Management***, 16(2), 337-360.

Heck, R.H. & Marcoulides, G.A. (1989). "Examining the Generalizability of Administrative Personnel Allocation Decisions." ***The Urban Review***, 21(1), 51-62.

Hofstede, G. H. (1984). ***Culture's Consequences. International Differences in Work-Related Values***. Second Edition. Newbury Park, London, New Dehli: Sage Publications.

Hofstede, G. H. (1991). ***Cultures and Organizations: Software of the Mind***. London, New York: MacGraw Hill.

House, J.J. (1981). ***Work Stress and Social Support***. Reading, MA: Addison Wesley.

Jackson, S.E. (1983). "Participation in Decision Making as a Strategy for Reducing Job-Related Strain." ***Journal of Applied Psychology***, 68(1), 3-19.

Jackson, S.E. & 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(1), 16-78.

Jayaratne, S., Himle, D. & Chess, W.A. (1988). "Dealing with Work Stress and Strain: Is the Perception of Support More Important than its Use?" ***Journal of Applied Behavioral Science***, 24(2), 191-202.

Jöreskog, K.G. & Sörbom, D. (1993). ***LISREL VIII, User's Reference Guide***. Chicago, IL: Scientific Software.

Kirkcaldy, B.D. & Cooper, C.L. (1992). "Cross-Cultural Differences in Occupational Stress Among British and German Managers." ***Work & Stress***, 6(2), 177-190.

Kirkcaldy, B.D. & Cooper, C.L. (1994). "Occupational Stress Profiles of Senior Police Managers: Cross-Cultural Study of Officers From Berlin and Northern Ireland." ***Stress Medicine***, 10(2), 127-130.

Kirkcaly, B.D., Furnham, A.F. & Lynn, R.A. (1992). "National Differences in Work Attitudes Between the U.K. and German." ***European Work and Organizational Psychologist***, 2(1), 81-102.

Kirkcaldy, B.D. & Hodapp, V. (1989). "Individual Differences and Subjective Stress and Dissatisfaction at Work." ***Studia Psychologica***, 1(1), 27-40.

Kreitner R. & Kinicki, A. (1992). ***Organizational Behavior***. Homewood Il: Irwin.

Lazarus, R.S. (1991). "Psychological Stress in the Workplace." ***Journal of Social Behavior and Personality***, 6(1), 1-13.

Marino, K.E. & White, S.E. (1985). "Departmental Structure, Locus of Control and Job Stress: the Effect of a Moderator." ***Journal of Applied Psychology***, 70(4), 782-784.

Marsh, H.W., Balla, J.R. & McDonald, R.P. (1988). "Goodness-of-Fit Indexes in Confirmatory Factor Analysis: The Effects of Sample Size." ***Psychological Bulletin***, 103(3), 391-410.

Matteson, M.T. & Ivancevich, J.M. (1987). "Individual Stress Management Interventions: Evaluation of Techniques." ***Journal of Managerial Psychology***, 2(1), 24-30.

McCormick, I.A. & Cooper, C.L. (1988). "Executive Stress: Extending the International Comparison." ***Human Relations***, 41(1), 65-72.

Minter, S.G. (1991). "Relieving Workplace Stress." ***Occupational Hazards***, April, 39-42.

Moore, R.W. (1990). "Time, Culture and Comparative Management: A Review and Future Direction." In S.B. Prasad (Ed.) ***Advances in International Comparative Management***, 5, 5-15.

Murphy, L.R. (1988). "Workplace Interventions for Stress Reduction and Prevention." In C.L.Cooper & R.Payne (Eds.) ***Causes, Coping and Consequences of Stress at Work***, Chichester: John Wiley.

Neale, M.S., Singer, J.A., Schwartz, G.E. & Schwartz, J.I. (1982). "Conflicting Perspectives on Stress Reduction in Occupational Settings: A Systems Approach to their Resolution." Cincinnati: ***Report to the National Institute for Occupational Safety and Health.***

Parkes, K.R. (1984). "Locus of Control, Cognitive Appraisal, and Coping in Stressful Episodes." ***Journal of Personality and Social Psychology***, 46(3), 655-668.

Pearlin, L.I. & Schooler, C. (1978). "The Structure of Coping." ***Journal of Health and Social Behavior***, 19(March), 2-21.

Pierce, J.L. & Newstrom, J.W. (1983). "The Design of Flexible Work Schedules and Employee Responses: Relationships and Processes." ***Journal of Occupational Behavior***, 4(2), 247-262.

Rees, D.W. & Cooper, C.L. (1992). "The Occupational Stress Indicator Locus of Control Scale: Should this be Regarded as a State Rather than Trait Measure?" ***Work and Stress***, 6(1), 45-48.

Robbins, S.P. (1993). ***Organizational Behavior: Concepts, Controversies, and Applications.*** Englewood Cliffs, NJ: Prentice-Hall.

Robertson, I.T., Cooper, C.L. & Williams, J. (1990). "The Validity of the Occupational Stress Indicator." ***Work and Stress***, 4(1), 29-39.

Rotter, J.B. (1966). "Generalized Expectancies for Internal Versus External Control of Reinforcement." ***Psychological Monographs: General and Applied***, 80(1), 1-28.

Sadri, G. & Marcoulides, G.A. (1994). "The Dynamics of Occupational Stress: Proposing and Testing a Model." ***Research & Practice in Human Resource Management***, 2(1), 1-19.

Schuler, R.S. (1980). "Definition and Conceptualization of Stress in Organizations." ***Organizational Behavior and Human Performance***, 25(2), 184-215.

Spector, P. (1987). "Interactive Effects of Perceived Control and Job Stressors on Affective Reactions and Health Outcomes for Clerical Workers." ***Work and Stress***, 1(1), 155-162.

Steffy, B.D. & Jones, J.W. (1988). "Workplace Stress and Indicators of Coronary-Disease Risk." ***Academy of Management Journal***, 31(3), 686-698.

Stevens, H.J. (1992). "Stress in California." ***Risk Management***, July, 38-43.

Stogdill, R.M. (1974). ***Handbook of Leadership: A Survey of Theory and Practice.*** New York: Free Press.

Storms, P.L. & Spector, P.E. (1987). "Relationships of Organizational Frustration with Reported Behavioral Reactions: The Moderating Effect of Locus of Control." ***Journal of Occupational Psychology***, 60(2), 227-234.

Van Sell, M., Brief, A.P. & Schuler, R.S. (1981). "Role Conflict and Role Ambiguity: Integration of the Literature and Directions for Future Research." ***Human Relations***, 34(1), 43-71.

Wall, T.D. & Clegg, C.W., (1981). "A Longitudinal Study of Group Work Redesign." ***Journal of Occupational Behavior***, 2(1), 31-49.

Wheaton, B., Muthén, B., Alwin, D.F. & Summers, G.G. (1977). "Assessing Reliability and Stability in Panel Models." In D.R. Heise (Ed.) ***Sociological Methodology***, San Francisco: Jossey-Bass.

Williams, R. (1989). ***The Trusting Heart: Great News About Type A Behavior***. New York: Times Books.

Zylanski, S.J. & Jenkins, C.D. (1970). "Basic Dimensions within the Coronary-Prone Behavior Pattern." ***Journal of Chronic Diseases***, 22(4), 781-795.