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DYSFUNCTIONAL ATTITUDE AND OCCUPATIONAL STRESS PROCESS: A TEST OF THE ORGANISATIONAL STRESS MODEL

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The relationship between occupational stress, dysfunctional attitudes and the cognitive phenomenological theory of stress and coping (CPS theory) was examined in this paper. Specifically, two tests, with a total of 244 subjects, were conducted on: 1) The relevance of dysfunctional attitudes to the aetiology of occupational stress, and 2) The validity of CPS theory on occupational stress. The different magnitudes of stress were also taken into consideration, this led to the collection of 2 sets of data. They were data from perceived high and perceived low occupational stress events. Results from structural equation modeling indicated that the CPS theory could not adequately represent data from both high and low occupational stresses. However, other statistical results indicated significant relationships between variables in the CPS theory. This suggested that the aetiological process of occupational stress was more complex than that depicted in the CPS theory. Dysfunctional attitude was found to be relevant to the aetiology of high occupational stress but not in low occupational stress. It appeared that dysfunctional attitude was triggered only when the occupational stress level reached a certain threshold. Hence, two structurally different aetiological models were developed for high and low occupational stresses. Implications of the above findings were also discussed in this paper.

Key words: dysfunctional attitude, deep level cognition, occupational stress, cognitive phenomenological theory of stress and coping, aetiological process

Occupational stress is now a major concern of the 90s and will very likely to be so in the next millennium. Today, there is nowhere more evident of the detrimental impacts of stress in the work environment and its effect is not restricted to just the employees but also the organisations that hire them. Although researchers (e.g. Cooper, 1983; Cooper & Marshall, 1976; Israel, House, Schurman, Heaney, & Mero, 1989) have identified several major stressors in occupational stress; for example work overload/under-load, poor work conditions, poor person-environment fit, and financial difficulties; the relationship between the above stressors and the eventual manifestation of occupational stress in an individual is not a simple case of cause and effect phenomenon. Any stressor could have presented itself in a person, but he/she may not necessarily experience stress. This is because of a huge complex network of factors operating in the gap between stress-causing elements and the outcomes of occupational stress (Folkman & Lazarus, 1986; Jerusalem, 1990). These mediating and moderating factors are the ones that determine if the existing occupational

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stressors were strong enough to elicit a negative impact on an individual.

Attempts to understand the entire stress sequence, whether work-related or just stress in general, will not succeed by focusing only on two conceptual domains: the sources of stress at the beginning and the manifestation of stress at the end. Attention should also be directed on the mediators and moderators of stress that are essentially psychological and behavioural intervening factors that operate in the stress sequence. A good example is the 'Cognitive Phenomenological Theory of Stress and Coping' developed by Lazarus and Folkman (1984). This theory investigated the cognitive process by which the significance of stimuli is understood and appraised; and the behavioural response (coping strategies) to the stressful stimuli (Folkman, 1984; Folkman & Lazarus, 1986; Lazarus, 1966).

The cognitive phenomenological theory of stress and coping states that three processes, the primary and secondary cognitive appraisals as well as coping strategies mediate the relationship between a stressful event and the subsequent emotional outcomes experienced by the person (Folkman & Lazarus, 1986; Lazarus & Folkman, 1984). These mediating processes are considered crucial for understanding how a person perceives a potentially stressful event and why different people react differently to the same stressful situation. The fundamental principle behind this theory is that stress is a consequence of the interaction between an individual and his/her environment; the individual factors are able to act on the environmental factors and vice versa. The chain of influence among the mediators, stressors and outcomes of stress (if coping strategies are not successful) is as follows; Stressors=>Primary Appraisal=>Secondary Appraisal=>Coping Strategies=>Outcomes of stress.

In the past, the validity of Lazarus and Folkman's (1984) theory was supported by numerous studies and used successfully as the theoretical foundation of stress research (e.g. Manzi, 1986; Nakano, 1991; Dewe, 1991a; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985), but its external validity in relation to its relevance to stress of different levels/magnitudes remains unclear (Goh & Oei, 1998). For example in some studies, subjects were asked to recall past stressful events for analysis, they were often required to list only the most stressful or a highly stressed event (Goh & Oei, 1998). As it is known, stress as experienced by an individual is not always of the same magnitude. Sometimes an encountered event may be perceived as highly stressful and at other times it is just mildly stressful. The key issue is that stress can vary in its magnitude as perceived by the individual. Since cognitive perception of stress can vary, it is conceivable that the cognitive process operating within a high stress event may differ from that operating in a low stress event.

There were studies (for example Drumheller, Eicke, & Scherer, 1991; McDonald & Korabik, 1991) that examined variations at different stress levels and how that relates to certain components of the stress process postulated by Lazarus and Folkman (1984). Although their results indicated differences related to the various magnitudes of stress experienced, a closer look at their research design showed that it was based on the assumption that the linear process depicted in the cognitive phenomenological theory of stress and coping was valid. In other words, the validity of the basic

structure of the process at different stress levels was not challenged. For example, the results of Drumheller, Eicke, and Scherers' (1991) study indicated that subjects in a high stress group exhibited more cognitive (i.e., appraisal processes) and behavioural (coping) responsiveness than those in the low stress group. Although the above findings suggested cognitive and behavioural differences within the process at different stress levels, they however did not question if the linear stress process depicted in the cognitive phenomenological theory of stress and coping was valid. Hence, the validity of this theory across different stress levels remained uncertain.

Dysfunctional attitude is a cognitive concept commonly used in clinical studies of depression. According to Beck, Rush, Shaw, and Emery (1979), dysfunctional attitude arises from a set of stable cognitive schemata that are formed as a result of early life experiences. These schemata often involve exceedingly rigid and inappropriate beliefs about the self and the world. They function cognitively as filters, which allow an individual to interpret the vast amount of information, gathered during their day-to-day interaction with the world. Since dysfunctional attitude has been established as an intervening variable in anxiety and depression (Kwon & Oei, 1992, 1994; Oei, Goh, & Kwon, 1996), it would therefore be reasonable to assume its presence in the stress process (Goh & Oei in preparation). This is because stress, like anxiety and depression, is also a form of emotional distress. Individuals who suffer from anxiety or depression are likely to have experienced stress as well.

Clinical studies of depression and anxiety have established automatic thought as a mediator which is surface cognition operating in the process. This mediator is in turn affected by dysfunctional attitude (deep level cognition) which functions as a moderator (Kwon & Oei, 1992, 1994). Such a relationship between deep level and surface level cognition is also likely to exist in stress process. For example Lazarus and Folkman (1984) have claimed in their stress theory that mediators operated in the stress process, namely; the primary appraisal, secondary appraisal and coping strategies of the person. These mediators appear to fit adequately the definition of surface level cognition. This is because they are also observable, involve self-statements, covert verbalisation and the ability to resolve the stressful situation. If this surface level cognition can operate in the stress process then it is conceivable that deep level cognition is also present. Thus dysfunctional attitude is likely to be the deep level cognition that interacts with the stress mediators.

As dysfunctional attitude is a cognitive schema, the major thrust of its influence on the stress mediators of the cognitive phenomenological theory of stress and coping will be directed at the cognitive appraisal processes (i.e., the primary and secondary appraisal processes). To have a dysfunctional attitude or dysfunctional beliefs about the self and the world means that the individual's initial assessment (primary appraisal) of a potentially stressful situation (whether it is threatening or benign) may be affected and eventually became inaccurate. This initial judgment will in turn affect their subsequent plans (i.e., their secondary appraisal and coping strategies) to resolve the situation.

The present paper intend to test the role of dysfunctional attitude as a deep level

cognition interacting with the cognitive mediators of cognitive phenomenological theory of stress and coping. Since the framework of Lazarus and Folkman's (1984) theory is used in the present study, it's validity as a theoretical model is crucial. In other words, the theory's validity needs to be tested first before dysfunctional attitude's role in the stress process can be examined. The aim of this paper was therefore twofold. To determine the external validity of the cognitive phenomenological theory of stress and coping developed by Lazarus and Folkman (1984) across 2 different stress levels. To then examine where dysfunctional attitude, a deep level cognition, operate as an intervening variable in the stress process as conceptualised by Lazarus and Folkman's (1984) theory. It is hypothesised that individuals with high level of dysfunctional attitude are more likely to experience high stress level.

Method

Subjects:

244 (80 males and 164 females) undergraduates enrolled in introductory psychology courses at The University of Queensland, Australia were used. Because the study was investigating the process in work stress, the recruited subjects were required to have at least six months work experience. The students participated on a voluntary basis to fulfil their psychology course requirements. The mean age of the 244 subjects was 22.6 years (SD=7.6).

Measures:

The questionnaire used five sets of scales. Four scales measured the individual components of the stress process (i.e., primary appraisal; secondary appraisal; coping strategies; and the manifestations of stress) as postulated by the cognitive phenomenological theory of stress and coping (Lazarus & Folkman, 1984). The fifth scale, the dysfunctional attitude scale (Weissman & Beck, 1978), measured the level of dysfunctional attitudes in the subjects. A brief description of each scale follows:

Primary Appraisal and Secondary Appraisal: The primary and secondary appraisal measures were adapted from Dewe's (1991a, 1991b) studies. The primary appraisal measure was an eight items questionnaire developed by Folkman, Lazarus, Dunkel-Schetter, DeLongis and Gruen (1986). Subjects were asked to think of an encountered stressful event and describe it in the questionnaire. Then, on a 5 point scale (1=not at all to 5=applies a great deal) the subjects were asked to describe how they felt about that stressful event. The eight items were; 1)feeling you would not achieve an important goal; 2)feeling you would lose the respect of someone important to you; 3)appearing incompetent; 4)feeling threatened; 5)feeling embarrassed; 6)appearing to be an unsupporting person; 7)appearing difficult to get along with and 8)appearing to be in the wrong. A principal components analysis with varimax rotation of the above eight items was performed by Dewe (1991a). Results indicated that the first five items which describe a feeling of not being able to achieve, constituted one factor (M=2.04, SD=.868, α=.73) and the remaining items which describe a feeling of being seen as a difficult person, formed another factor (M=1.59, SD=.834, α=.80). The overall score in this scale will therefore reflect the degree of a person's perception of the encountered event as threatening and potentially stressful. Both factors explained 41.4 and 19.7 per cent of the variance. A Cronbach alpha reliability test was conducted on the primary appraisal scale for high and low stress group with values of 0.76 for high stress group and 0.81 for low stress group.

The secondary appraisal measurement was developed by Folkman and Lazarus (1980). Respondents were asked to consider each of the items and indicate which described the situation they have written about. If a number of items were ticked then respondents were asked to underline the item which best described the situation (Dewe, 1991a, 1991b). For the purpose of EQS analysis in this study, respondents were specifically asked to describe each item based on a five point scale (1=not at all to 5=applies a great deal). There are six items; four from Folkman and Lazarus (one that you could change or do something about; one that must be accepted or just got used to; one where you needed to know more before you could act; and one where you had to hold yourself back from doing what you wanted to do). Two were added by

Dewe (1991a): one where organisational bureaucracy made it difficult to deal with; and one where if you dealt with it in the way you wanted to it would have made things difficult for you. The Cronbach alpha reliability test indicated values of 0.40 for high stress group and 0.63 for low stress group.

Coping Strategies: Coping strategies were measured by a 42 item Ways of Coping Checklist revised by Vitaliano et al. (1985). A principal components analysis conducted by the researchers resulted in six factors with λs greater than 1 (Vitaliano et al., 1985). The final outcome of the revision was a 42 item checklist with 5 categories: problem-focused coping=15 items; seek social support=6 items; blame self=3 items; wishful thinking=8 items; and avoidance=10 items. The checklist has high reliability values from the high stress group (Cronbach alpha value=0.87) and the low stress group (Cronbach alpha value=0.90).

Manifestations of Stress or stress outcomes: The level of stress or strain experienced by respondents as a result of the stressful events described in the questionnaire was measured by a component of the Organisational Stress Inventory (OSI). The OSI is a concise measure of three dimensions of occupational adjustment: occupational stress, psychological strain, and coping resources. The measurement or component used in this study was the Personal Strain Questionnaire (PSQ) comprised of four scales: Vocational strain, measuring the extent to which an individual has problems in work quality or output. Attitudes towards work are also measured; psychological strain, which measures the extent of psychological and/or emotional problems experienced by the individual; interpersonal strain, where the extent of disruption in interpersonal relationships is measured; and physical strain, which measures complaints about physical illness or poor self-care habits (Osipow & Spokane, 1987). The total score of this scale represented the overall stress experienced by an individual. As the subjects in this study were mainly students and were mostly not married, two items in the PSQ were therefore excluded from analysis. They were: item 22; "I quarrel with my spouse" and item 24; "My spouse and I are happy together". Reliability test on this scale indicated high Cronbach alpha values of 0.92 for high stress group and 0.91 for low stress group.

Dysfunctional Attitude Scale (DAS): The dysfunctional attitude scale was developed by Weissman and Beck (1978). It contains 40 items. It is a self-report inventory that measures the degree of dysfunctional attitude in the respondent. The scoring system ranges from 40 to 180 with the highest score indicating the highest level of dysfunctional attitude in a person. The scale has a test re-test reliability of 0.73 in Oliver and Baumgarts' study (1985). Other studies (e.g. Olinger, Kuiper, & Shaw, 1987; Hill, Oei, & Hill, 1989) have also demonstrated the internal validity and reliability of the scale.

Procedure:

The data were collected over a series of group administrations. Eight sessions were conducted, where subjects filled in the questionnaire in a classroom setting. The questionnaire has two sections, the first section focused on high stress event and the second focused on low stress event. Both events were work-related experiences. Detailed instructions were given to the subjects before they started and the approximate time to complete the questionnaire was one hour. Before the session, subjects were asked specifically to recall some stressful events they had encountered over the last one month of their working experience. Then they were asked to prioritize the listed events in terms of the degree of stress they experienced from each of them. Once the subjects have prioritized the events, they were asked to describe the most stressful and the least stressful events in separate spaces provided by the questionnaire. Subjects with difficulties in prioritizing their stressful events were asked to note down only the most stressful one. Once the two events were listed, subjects were asked to proceed on with the questionnaire.

Out of the 244 returned questionnaires, only 137 questionnaires listed events as low stress in nature. Questionnaires that were rejected either did not have a completed low stress section, listed event that was not low stress in nature compared to the high stress event, or did not clearly explained the nature of the events. Thus there were two sets of data: 244 responses of a high stress event and 137 responses of a low stress event. It is important to note that the data included questionnaires that were not fully completed. The total number of completed questionnaires is as follows: High stress event N=217 and Low stress even N=113.

RESULTS

Examine and Frequencies procedures from SPSS were performed on the low

stress and high stress data to test for normality, linearity and homoscedasticity. Preliminary results indicated skewness in three variables of the low stress event data: the total scores of primary appraisal scale; total score of secondary appraisal scale; and the total score of the Personal Strain Questionnaire. Transformation procedures to normalise the above mentioned variables were carried out with square root transformations performed on total score of secondary appraisal scale and total score of the Personal Strain Questionnaire, and logarithmic transformation performed on total score of primary appraisal scale. The means, standard deviations, and Pearson product-moment correlations of scores from Dysfunctional Attitude Scale, primary appraisal, secondary appraisal, coping strategies and Personal Strain Questionnaire

Table 1. Mean, Standard Deviations (*SD*) and Pearson Product-Moment Correlation of Variables in High Stress Data and Low Stress Data

High Stress Event

N of Cases=217			Correlation Coefficients			
Variable	Mean	*SD*	*DA*	*PS*	*SA*	*CS*
Dysfunctional Attitude (DA)	129.237	30.063	*DA* —			
Primary Appraisal (PA)	24.351	6.878	*PA* 0.25*	—		
Secondary Appraisal (SA)	18.602	4.533	*SA* 0.09	0.35*	—	
Coping Strategies (CS)	114.957	23.357	*CS* 0.20*	0.34*	0.41*	—
Stress Outcomes (SO)	95.297	23.298	*SO* 0.32*	0.29*	0.37*	0.49*

*$p<.001$

Low Stress Event

N of Cases=113			Correlation Coefficients			
Variable	Mean	*SD*	*DA*	*PS*	*SA*	*CS*
Dysfunctional Attitude (DA)	129.237	30.063	*DA* —			
Primary Appraisal (PA)	1.105	0.166	*PA* 0.14	—		
Secondary Appraisal (SA)	3.511	0.657	*SA* 0.06	0.45*	—	
Coping Strategies (CS)	89.874	23.43	*CS* 0.19	0.45*	0.41*	—
Stress Outcomes (SO)	8.494	1.123	*SO* 0.12	0.34*	0.39*	0.46*

*$p<.001$

Low Stress Event Vs High Stress Event

Variable	*t*-value	Degrees of Freedom	Probability
Primary Appraisal (PA)	15.16	136	*$p<.001$
Secondary Appraisal (SA)	12.18	136	*$p<.001$
Coping Strategies (CS)	11.18	125	*$p<.001$
Stress Outcomes (SO)	11.88	120	*$p<.001$

are presented in Table 1. A *t*-test was performed on scores of primary appraisal, secondary appraisal, coping strategies, and Personal Strain Questionnaire to determine if there was a significant difference between data from the high stress event and data from the low stress event. Results indicated that the high stress data was significantly different from the low stress data in all the four variables (refer to Table 1), therefore it is possible that the operating process in a high stress event differs from that of a low stress event.

Results of EQS analysis

Structural equation modeling with EQS (Byrne, 1994; Hoyle, 1995) was conducted on both high and low occupational stress data. Structural models depicting the cognitive phenomenological stress process (Lazarus & Folkman, 1984; Folkman & Lazarus, 1986) as well as the present proposed theory with dysfunctional attitude in the stress process were tested (see Figs. 1 and 2). Confirmation of the models' validity was determined by their degree of fit to the data. Specifically, a number of fit indexes with cut off points of 0.9 (Hoyle, 1995) and the *chi*-square value with $p > 0.01$ were used to judge the models' fit to both the high and low occupational stress data. The fit indexes employed in this study include: Bentler-Bonett Normed Fit Index (NFI), Bentler-Bonett Nonnormed Fit Index (NNFI), and Comparative Fit Index (CFI).

Fig. 1 represents the basic relational paths of the various components/variables

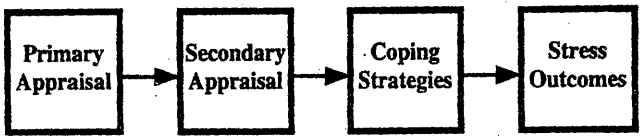

Fig. 1. Basic paths as depicted in the cognitive phenomenolgical theory of stress and coping (CPS Model).

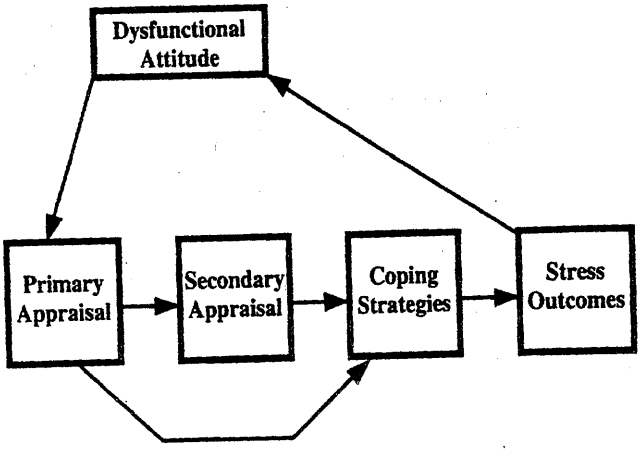

Fig. 2. The occupational stress model (OS Model).

involved in the cognitive phenomenological theory of stress and coping. The arrows represent the direction of influence of each variable under high or low occupational stress. The above diagram indicates that the primary appraisal process has an impact on the secondary appraisal which in turn affects the coping strategies. Eventually the outcome of the coping strategies determines the level of stress (Stress Outcomes) experienced by the individual.

Fig. 2 represents this paper's recommended theoretical model for high or low occupational stress (OS model). This model has the basic paths of the cognitive phenomenological theory of stress and coping. In addition, it shows three more paths or arrows. One path starts from dysfunctional attitude and leading to primary appraisal; it represents the main thrust of dysfunctional attitude's influence on primary appraisal. The second path leads from the stress experienced by the individual as measured by Personal Strain Questionnaire (stress outcomes) back to dysfunctional attitude. This path reflects the definition of dysfunctional attitude as a cognitive schema formulated from past experience (Beck, Rush, Shaw & Emery, 1979). In other words, the stress experienced by the individual will in return have some impact onto dysfunctional attitude. The third path moves from primary appraisal to coping strategies representing the hasty response trying to come up with numerous coping strategies to the perceived high stress where secondary appraisal is by passed. There were altogether four structural models to be tested: Two models were based on the CPS theory (Folkman & Lazarus, 1986) represented by Fig. 1 with one model for the high occupational stress data and one for the low occupational stress data. They are known as CPS models in this paper. The other two models were based on this paper's proposed theory that included dysfunctional attitude in the stress process of CPS theory (refer to Fig. 2). This new model will be named as Occupational Stress Model (OS model). One model will represent low stress (Low OS model) and one for high stress (High OS model).

The basic 3 paths CPS model.

Both high and low CPS models were not successfully tested by EQS. The high stress model had parameters (paths) that were linearly dependent on other parameters indicating that they are under-identified (Byrne, 1994). The low stress model had iterations exceeding the default value of 30, even after attempts to change the start values were made. A message warning the user not to trust the output was issued suggesting that the low stress model was not an adequate fit for the data (Byrne, 1994). The above results suggested that the basic three paths CPS model failed to adequately capture the process in high and low occupational stress. However, this did not mean that the CPS theory was invalid. It merely meant that occupational stress process might involve more paths and/or variables than were presented in the existing CPS model. To further examine the validity of this basic three path model, multiple and hierarchical regressions were carried out on all its variables to determine if there were sufficient significant relationships among them.

Multiple regression on high and low stress data indicated that primary appraisal

significantly predicted secondary appraisal; secondary appraisal, in turn, significantly predicted coping strategies; and coping strategies significantly predicted stress outcomes measured by Personal Strain Questionnaire. Similarly, results from hierarchical regression showed secondary appraisal and coping strategies of high and low stress data significantly predicted stress outcomes; $p<0.05$ (refer to Tables 2 and 3). In addition to the above findings, the significant correlation figures between all variables in the CPS model (refer to Table 1) provided further evidence of the model's validity with its basic three paths. Hence, there were sufficient justifications to retain the CPS model and improve it further.

The present paper proposed to improve the CPS model for occupational stress by making the following additions. First, dysfunctional attitude was introduced into the occupational stress process. Second, a path leading from primary appraisal directly to coping strategies was included (refer to OS model in Fig. 2).

Table 2. Regression of Variables from the Basic Three Paths CPS Theoretical Model CPS Model for High Stress

DV and IV	Beta	SR^2	*t*-value	Sig. *t*	Multiple *R*	R^2	*F*-value	Sig. *F*
IV=Primary Appraisal DV=Secondary Appraisal *N*=240	0.35	0.12	5.664	0.000	0.345	0.119	32.084	0.0000
IV=Secondary Appraisal DV=Coping Strategies *N*=229	0.41	0.16	6.674	0.000	0.405	0.164	44.541	0.0000
IV=Coping Strategies DV=Stress Outcomes *N*=226	0.49	0.24	8.309	0.000	0.485	0.236	69.046	0.0000

Note: DV=Dependent Variable, IV=Independent Variable

Table 3. Regression of Variables from the Basic Three Paths CPS Theoretical Mode CPS Model for Low Stress

DV and IV	Beta	SR^2	*t*-value	Sig. *t*	Multiple *R*	R^2	*F*-value	Sig. *F*
IV=Primary Appraisal DV=Secondary Appraisal *N*=133	0.45	0.20	5.765	0.000	0.450	0.202	33.237	0.0000
IV=Secondary Appraisal DV=Coping Strategies *N*=123	0.41	0.17	4.960	0.000	0.411	0.169	24.598	0.0000
IV=Coping Strategies DV=Stress Outcomes *N*=113	0.46	0.21	5.413	0.000	0.457	0.209	29.301	0.0000

Note: DV=Dependent Variable, IV=Independent Variable

The Occupational Stress Model (OS model)

EQS analysis indicated that the OS model was able to adequately fit both high and low occupational stress data. The results showed significant *chi*-square values of $\chi^2(4, N=217)=11.402, p<0.05$, NFI=0.94, NNFI=0.89, CFI=0.96 for high stress model; and $\chi^2(4, N=113)=9.038, p<0.10$, NFI=0.90, NNFI=0.85, CFI=0.94 for low stress model. It is important to note that the NNFI values from both high and low stress data in this study did not meet the cut off point of 0.9 (Bentler & Bonett, 1980). However, research has shown that NNFI is sensitive to sample size with a tendency to reject models when N level is small (Hoyle, 1995). For example, at sample size of 150, NNFI based on Maximum Likelihood (ML) estimation rejects 30% of the models (Hu & Bentler, 1993). Thus NNFI values based on ML in this study did not render much worry as despite their relatively small sample sizes, they still remained very close to the 0.9 cut off point.

The OS models for high and low occupational stress data differed structurally (refer to Figs. 3 and 4). The model for high occupational stress data (Fig. 3) indicated dysfunctional attitude's influence on primary appraisal and in turn was affected by the

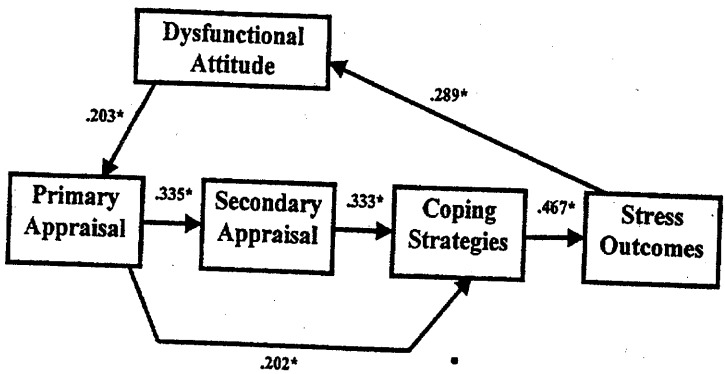

Fig. 3. Path coefficients of high occupational stress model.
*$p<0.05$

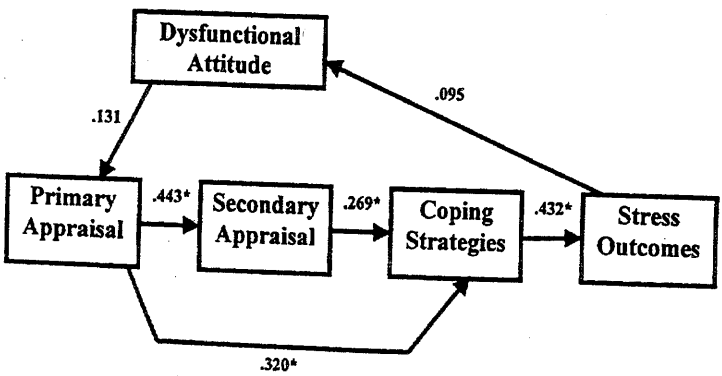

Fig. 4. Path coefficients of low occupational stress model.
*$p<0.05$

outcomes of stress. This chain of influences was however not found in the model for low occupational stress data. Specifically, the paths in the low OS model leading from dysfunctional attitude to primary appraisal and from outcomes of stress to dysfunctional attitude were not significant (refer to Fig. 4). The above findings suggested that dysfunctional attitude might be present or activated only in situations of perceived high occupational stress.

Regression analyses were conducted to determine if there was further statistical evidence to support the above findings. The regression results (refer to Tables 4 and 5) showed only significant relationships in the high OS model where stress outcomes predicted dysfunctional attitude and the latter in turn predicted primary appraisal. There was no significant result in the low OS model. These statistical findings were also supported by the correlation figures of the variables in both high and low OS models. Specifically, dysfunctional attitude correlated with primary appraisal, coping strategies, and stress outcome in the high OS model but none in the low OS model (refer to Table 1). Despite the above structural difference, both high and low OS models shared two common features. One, the basic three paths of the CPS theory remained significant in the EQS results. Two, both models have a path leading from primary appraisal to coping strategies suggesting that primary appraisal's by-passing of secondary appraisal was not unique to only high occupational stress situation. This alternative path might be a common phenomenon

Table 4. Regression of Stress Outcomes, Primary Appraisal & Dysfunctional Attitude High Stress

DV and IV	Beta	SR^2	*t*-value	Sig. *t*	Multiple *R*	R^2	*F*-value	Sig. *F*
IV=Stress Outcomes DV=Dysfunctional Attitude *N*=221	0.32	0.10	4.99	0.0000*	0.310	0.102	24.873	0.0000*
IV=Dysfunctional Attitude DV=Primary Appraisal *N*=226	0.25	0.06	3.78	0.0002*	0.245	0.060	14.289	0.0002*

Note: DV= Dependent Variable, IV=Independent Variable, *Significant, $p<0.001$

Table 5. Regression of Stress Outcomes, Primary Appraisal & Dysfunctional Attitude Low Stress

DV and IV	Beta	SR^2	*t*-value	Sig. *t*	Multiple *R*	R^2	*F*-value	Sig. *F*
IV=Stress Outcomes DV=Dysfunctional Attitude *N*=117	0.12	0.02	1.33	0.1861	0.123	0.015	1.769	0.1861
IV=Dysfunctional Attitude DV=Primary Appraisal *N*=132	0.14	0.02	1.647	0.1019	0.143	0.020	2.714	0.1019

Note: DV= Dependent Variable, IV=Independent Variable, *Significant, $p<0.001$

to occupational stress on the whole.

In summary, the above results indicated: The presence of a feedback system leading from the outcome of occupational stress (overall score of Personal Strain Questionnaire) to dysfunctional attitude in the high stress process but not in the low stress process. Dysfunctional attitude was found to have no impact on the variables of low occupational stress process. Lastly, primary attitude in both high and low occupational stress processes held an alternative path that by-passed secondary attitude and linked directly to coping strategies.

Discussion

The results from the EQS Analysis and the SPSS Regressions have, in principle, supported the cognitive phenomenological theory of stress and coping (Lazarus & Folkman, 1984) in regards to its external validity. However the results also indicate that the process in the CPS model could not adequately represent occupational stress. It appeared that occupational stress was more complex than what was postulated in the cognitive phenomenological theory of stress and coping. Nevertheless, the variables in the cognitive phenomenological theory of stress and coping (i.e., stressful event, primary appraisal, secondary appraisal, coping strategies, and stress outcomes as measured by personal strain questionnaire) could be viewed as core components of stress. The linear relationship of the above mentioned variables was the basic or prevalent process proposed by Lazarus and Folkman (1984) to explain the aetiology of stress.

When distinction was made between the different magnitudes of occupational stress experienced (i.e., whether it is high stress or low stress), the linear relationship in the cognitive phenomenological theory of stress and coping could no longer stand. Specifically, results from the present study suggest that the high OS model and the low OS model were different in terms of the number of paths as well as in the number of variables involved (refer to Figs. 3 and 4). The feedback system in Fig. 3 suggested that high occupational stress process was cyclical in nature. This seemed more probable with dysfunctional attitude in the process where at the end of the linear relationship, the effects of stress experienced by the individual will, in turn, have an impact on his/her dysfunctional attitude. Hence Beck et. al.'s (1979) definition of dysfunctional attitude as cognitive schema formulated by past experiences appeared to be supported in this study.

The path that led from primary appraisal directly to coping strategies and by passing secondary appraisal indicated that the occupational stress process was capable of operating at a faster pace. This is not unusual; as in the case of high work stress situations, they are often characterised by serious time constraints that require fast thinking and fast reactions. Jerusalem (1990) mentioned that there are different levels of appraisal processes within primary appraisal. Specifically, after an event is appraised as stressful, one would then move on to appraisal of the event as either threatening, challenging, harmful or a loss. Hence in situations where immediate

responses are needed, the time taken to run through primary appraisal can be considerable. Therefore secondary appraisal may be skipped and coping strategies are engaged immediately. In the case of low stress, the encountered situation may be so frequent and common to the individual that the coping responses are readily available and automatic. Hence this individual simply engages in coping responses without consulting his/her secondary appraisal.

The most important finding in this paper was the role dysfunctional attitude played in the occupational stress process. Although dysfunctional attitude was found to affect primary appraisal and in turn were affected by stress outcomes in the high OS model; in the low OS model, dysfunctional attitude appeared to have no relationship with any of the stress variables. Dysfunctional attitude's presence in high occupational stress situation implies that only highly stressful work events or at least *perceived* highly stressful work events have the sufficient strength to invoke it. As dysfunctional attitude is also responsible for the experience of depression (Kwon & Oei, 1992, 1994; Oei, Goh, & Kwon, 1996), it can therefore be considered as an important causing factor of severe emotional distress. Future studies are advised to direct their attention to the "chicken and egg" question of whether dysfunctional attitude is in fact the consequence or antecedent of high stress, or both. The question of why dysfunctional attitude is not present in low occupational stress event is worth exploring as well.

The presence of a feedback mechanism appears crucial for a clearer explanation of the aetiological process of occupational stress. It seems that a complete structure of high occupational stress is made up of not just the forward linear relationships but also the feedback loop that links stress outcomes to dysfunctional attitude. Perhaps this link could be one of the reasons for stress to remain high as information was being fed back to dysfunctional attitude which may further affect the appraisal processes. Theories of stress are therefore likely to be more complete and accurate if they proposed a cyclical aetiological process rather than a linear process.

This study has also shed some lights on the overall structural difference between the aetiology of high work stress and low work stress. What it means is that the aetiological process of stress may differ depending on certain dimensions, such as: the magnitude of stress experienced (whether the event is high stress or low stress in nature); the types of stress (whether it is occupational stress, life stress, marital stress, or academic stress); the duration of stress experienced (whether it is chronic or short term); and the nature of the stress (whether the stress is a subjectively perceived one or a real stress felt by anyone). Hence, existing theoretical models of stress need to be re-examined to determine whether their validity is limited to specific stress type. Future researchers could also reassess the practicality of developing an all-encompassing theoretical model that propounds to represent stress in general. Since stress process can be very complex, an overall theory such as the cognitive phenomenological theory of stress and coping by Lazarus and Folkman (1984) may be too general. Instead, a family of related theories may be more effective in capturing the full repertoire of aetiological processes in stress.

The main weakness in this study lies in the need for subjects to list two stressful work experiences of different magnitudes (one high stress and the other low stress). This task proved to be difficult for some subjects. A number of subjects reported that they were unable to distinguish their actions and feelings for the high and low stress events, especially when the two events were closely related or very similar. Future studies of similar design might consider recruiting two separate groups of subjects, one for the low stress data and the other for the high stress data.

Conclusion

The current cognitive phenomenological theory of stress and coping (Lazarus & Folkman, 1984) can be taken as a skeletal structure of stress process. However it cannot sufficiently represent the whole process involved in occupational stress and perhaps any specified stress type. The present study has shown that dysfunctional attitudes are relevant to occupational stress and introduced a new model (The OS Model) to depict the aetiological process.

Reference Note

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